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replacement/transit improvement study

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Phase I Feasibility Report

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Enclosed with this letter are copies of: the full Replacement/Transit Improvement Study Phase I Feasibility Report; the Summary Report with Spanish Translation; and, a handout from the January 31st Project Working Committee Meeting.

The study is an analysis of current and future public transportation needs in the South End, Roxbury, Dorchester, and Mattapan areas. The objective is to develop an overall transportation strategy for the study area and to decide on specific services of public transportation after the Orange Line is re-located and the elevated is removed.

The study is being managed by the MBTA's Southwest Corridor Development office. The two principal consultant firms for the study area are: Tippetts-Abbett-McCarthy-Stratton (TAMS) and Childs Bertman Tseckares & Casendino Inc. (CBT). The State's Central Transportation Staff (CTPS) is providing assistance in developing forecasts of future transit ridership. Also on the consultant team are economists, urban planners, and a local development group (Greater Roxbury Development Corporation).

Phase II of this study is expected to begin after review and concurrence by the Urban Mass Transportation Administration (UMTA). During this interim period, we would appreciate receiving comments from you and others in the community about this study. If you would like more information, please contact us.

The Community Liaison Team

427-7060

replacement/transit improvement study

SOUTH END

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SOUTH END

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Phase I Feasibility Report

Prepared for the:

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
SOUTHWEST CORRIDOR DEVELOPMENT OFFICE

By:

. TIPPETTS-ABBETT-McCARTHY-STRATTON

In Association With:

- . CBT/Childs Bertman Tseckares & Casendino, Inc.
 - . Greater Roxbury Development Corporation
 - . John Brown Associates
 - . Richard Siegel Associates
 - . Cambridge Systematics, Inc.
- and:
- . The Central Transportation Planning Staff

This Feasibility Analysis is the first phase of the Replacement/Transit Improvement Study. The Study is consistent with Section 102 (2) of the National Environmental Policy Act of 1969 (42 U.S.C. s4322 (2) (c)); the Council on Environmental Quality Guidelines effective August 1, 1973; the U.S. Department of Transportation Procedures effective September 30, 1974 and Urban Mass Transportation Administration requirements.

Funds for this Study have been obtained from UMTA Technical Study Grant MA-20-9001.

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NEW ENGLAND REGIONAL MANAGER
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February 1, 1978

Mr. Robert R. Kiley, Chairman
Massachusetts Bay Transportation Authority
50 High Street
Boston, Massachusetts 02110

Dear Chairman Kiley:

RE: MBTA Contract No. 065-14
Feasibility Study and Alternatives
Environmental Impact Analysis,
South End/Roxbury Replacement Service
Dorchester/Mattapan Transit Service

We are pleased to submit herewith our Report on Phase I of the Replacement / Transit Improvement Study.

The Report describes the process used in developing alternatives and sets forth the transit alternatives which should be analyzed further during Phase II of the Study. A number of potential alignments for light rail transit and busway in a median reservation and passenger rail service on Midland Branch Railroad warrant further study. In Phase II we will develop plans for these alternatives in sufficient detail to assess relative impacts and to select a preferred transit system.

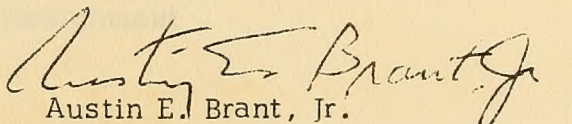
The Study has been a team effort and we particularly want to acknowledge the assistance provided by the Central Transportation Planning Staff, various divisions of the MBTA, the Boston Redevelopment Authority, the Mayor's Office on Transportation, and local citizens. The Study's focus on community participation has helped us to understand the needs of local residents and to incorporate these needs into the alternative plans. Our associated firm for community participation, Childs Bertman Tseckares Casendino, Inc., has been instrumental in making this program successful.

We have appreciated the opportunity to work closely with the Authority's Southwest Corridor Development Office and look forward to a continuing close relationship with this group in producing a workable plan to improve public transportation.

Very truly yours,

TIPPETTS-ABBETT-McCARTHY-STRATTON

cc: F. Salvucci, EOTC
W. Higgins, MBTA
A. Pangaro, MBTA


Austin E. Brant, Jr.

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Introduction

CHAPTER 1 INTRODUCTION

BACKGROUND AND STUDY OBJECTIVES

Public transportation for residents of Boston's South End, Roxbury, Dorchester and Mattapan communities is currently provided by the elevated Orange Line, the Ashmont Branch of the Red Line and an extensive bus network. However, the Washington Street Elevated's blighting effect and structural problems have long prompted consideration of demolishing the line. In 1972, subsequent to the Boston Transportation Planning Review (BTPR), construction of the proposed Southwest Expressway (I-95 extension) was cancelled, and Governor Sargent concluded that the Orange Line should be relocated in the corridor cleared for the expressway. At that time, it was recognized that some form of transit service should be provided in the South End and Roxbury to replace the elevated Orange Line, with a possible extension of that service to Mattapan through Dorchester.

Previous studies have identified a need for improved service in the study area and funds for providing it are included in the Boston region's Transit Improvement Program of 1977. However, further study is needed to determine the mode, alignment and extent of service.

The Replacement/Transit Improvement Study (R/TIS) is intended to provide the further analysis required to determine the type of service most appropriate to the area and acceptable to the agencies and communities involved. The service should utilize as efficiently as possible the other existing or planned transportation elements of the Massachusetts Bay Transportation Authority (MBTA) system.

The Replacement/Transit Improvement Study has five specific objectives as defined below:

- a) to re-examine the demand for public transportation services within the South End, Roxbury, Dorchester and Mattapan neighborhoods of Boston;
- b) to define a set of technologically and operationally feasible transit service alternatives for meeting that demand and leading to local community development;
- c) to provide continuity for transfer between any of the services under consideration;
- d) to assess and describe the social, economic and physical impacts on the environment of a few selected alternatives; and
- e) to propose one or more specific transit service improvements.

PROJECT SCHEDULE

The work is being performed in four phases. Phase I involves analysis of transportation alternatives consisting of:

- a) development of a citizen involvement mechanism;
- b) choice of appropriate demand forecasting techniques and cost-effectiveness analysis methodology;
- c) definition of community goals and transportation needs;
- d) determination of several alternative means of meeting those needs; and
- e) selection of a small set of the most promising transportation alternatives to be carried into Phase II for further analysis.

This report contains the findings and description of analysis in Phase I.

Phase II will consist of the development and environmental impact analysis of the sets of alternatives selected in Phase I, culminating in submission to the Urban Mass Transportation Administration (UMTA) of a Draft Environmental Impact Statement and Alternatives Analysis, and preparation of a separate Recommended Alternative Report describing in detail the preferred cost-effective alternative and the rationale for the choice of the proposed action.

Phase III will consist of a) incorporating UMTA's comments; b) a public hearing on the preferred alternative; and c) preparation of any capital grant application(s) being submitted for consideration at the public hearing.

Phase IV will involve preparation of the Final Environmental Impact Statement reflecting comments received during the hearings.

STUDY AREA

The study area is shown in Figure 1.1 and includes the South Cove and South End of Boston, Roxbury and sections of Dorchester and Mattapan, lying generally east of the Relocated Orange Line (South Cove to Forest Hills), west of the Red Line (Harvard-Ashmont) and north of the Mattapan High Speed Trolley Line.

RELATED PROJECTS

A number of transportation projects in the study area relate directly to the Replacement/Transit Improvement Study, and these are briefly described below and shown in Figure 1.2. Most of these projects are under the authority of the MBTA's Southwest Corridor Office.



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**STUDY AREA
LOCATION**



FIGURE 1.1

RELATED TRANSPORTATION PROJECTS

- Under Construction
- Under Design
- Under Study

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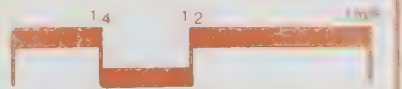


FIGURE 1.2

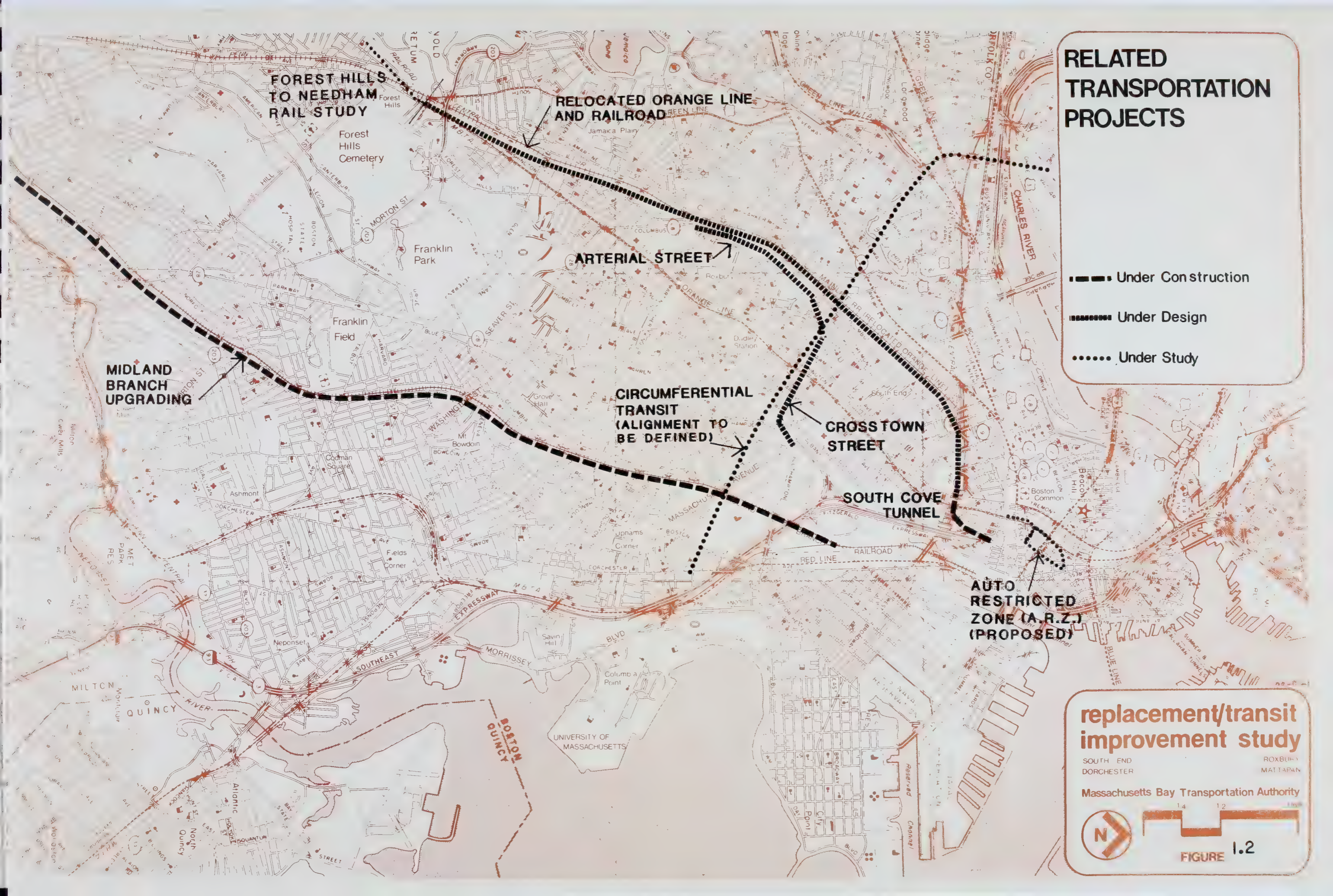


Figure 1.3 shows the chronological relationship of the Replacement/Transit Improvement Study to these other projects and previous relevant decisions.

Orange Line Relocation

The MBTA has filed an application for Federal capital grant assistance to UMTA to relocate approximately 4.7 miles of the existing Orange Line to the rapid transit mainline railroad alignment extending from South Cove to Forest Hills. The line would contain five tracks; three for commuter and intercity rail and two for the Orange Line. The application includes the removal of the existing Orange Line elevated structure along Washington Street. The project is currently under design and is expected to be completed in 1983.

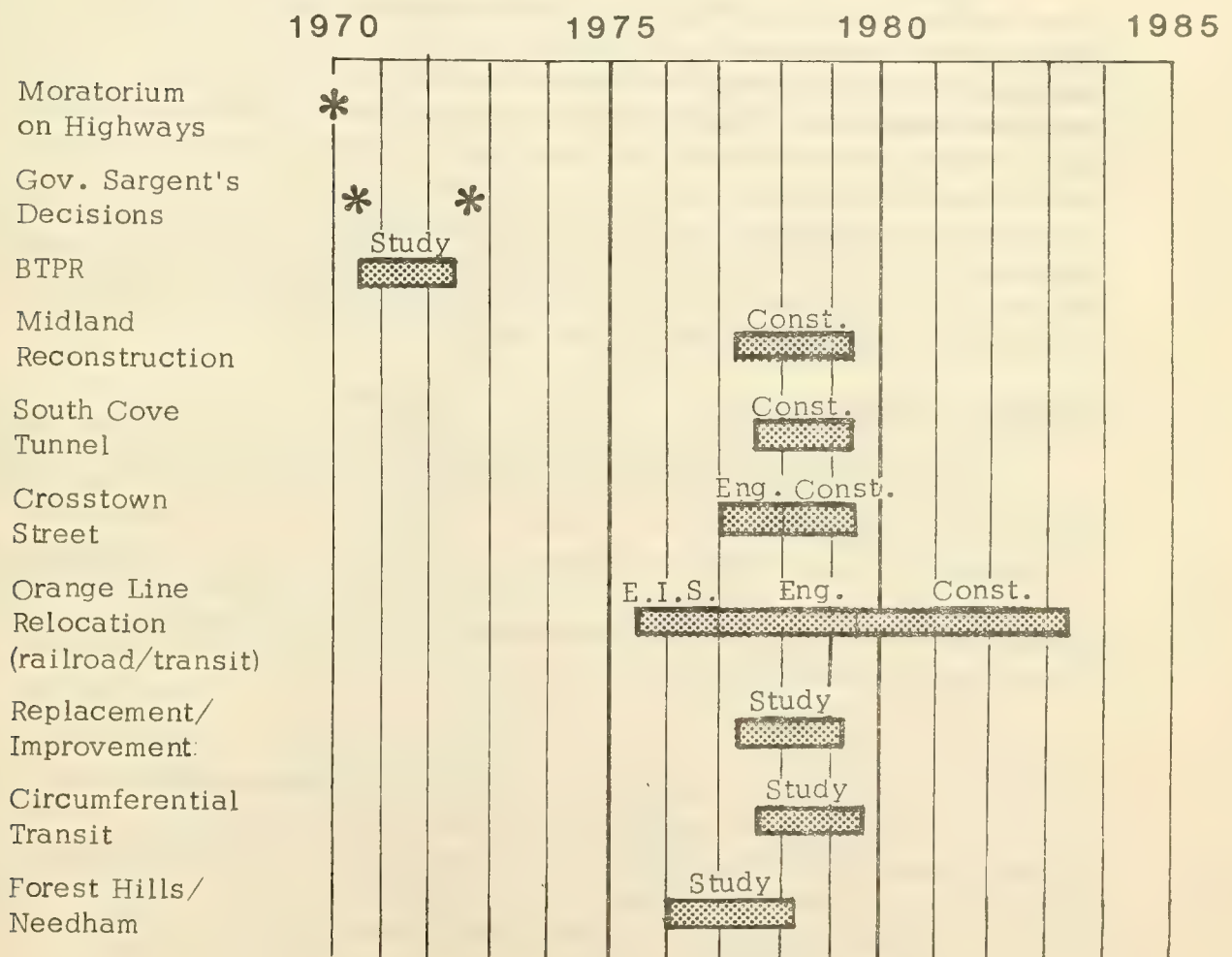


FIGURE 1.3
SOUTHWEST CORRIDOR TRANSPORTATION SCHEDULE

Arterial & Crosstown Streets

As part of the Southwest Corridor project, a new arterial street will be constructed between the Massachusetts Avenue exit of the Southeast Expressway and Jackson Square. The northern segment of this street runs through land previously cleared for the "Inner Belt" which in this section was cancelled at the same time as the Southwest Expressway. Right-of-way for this crosstown segment from the Massachusetts Avenue exit to Columbus Avenue includes a 40-foot transit easement and has potential use for both proposed replacement and circumferential transit systems. Both street segments are currently under design. Construction of the crosstown street should be completed in early 1979 while the arterial segment from Ruggles Street to Jackson Square should be completed at approximately the same time as the Orange Line Relocation.

Midland Branch Reconstruction

To facilitate construction of the relocated Orange Line, most commuter and intercity (AMTRAK) rail service currently using the mainline RR corridor will be diverted to the Midland Branch (Dorchester) Railroad during the construction period 1979 to 1983. The Midland Railroad, which runs from Readville to South Station, currently serves only occasional local freight service and will be upgraded to handle future rail service. Improvements include improved signalization, welded rail and fencing. Construction is expected to be completed in early 1979. The project is particularly relevant to the R/TIS since it provides a potential alignment for new rail transit service after commuter rail and AMTRAK service is returned to the relocated Orange Line corridor in 1983.

Circumferential Transit

The Central Transportation Planning Staff (CTPS) will investigate alternatives for crosstown transportation in the institutional-residential-industrial ring through Boston, Cambridge and Somerville in preparation for an Environmental Impact Statement. This service was originally proposed as part of the BTPR in the corridor originally proposed for the Inner Belt Expressway. The crosstown alignment runs through the study area in the lower Roxbury area.

South Cove Tunnel

Construction has begun on extension of the South Cove Tunnel. This project will permit the Orange Line to run between Essex, South Cove and Back Bay stations. The tunnel was partially completed in 1968 in conjunction with urban renewal activity in South Cove. It is now being extended under the Massachusetts Turnpike to the current mainline railroad corridor.

Auto Restricted Zone

Boston is one of a small number of cities applying for federal grants from UMTA to provide an auto-restricted zone (A.R.Z.) in part of downtown. The Boston ARZ is located in the downtown shopping district, primarily on Washington and Chauncy Streets. Various sections of it contain restrictions on autos, trucks and taxicabs. It has major implications on downtown-oriented bus service which will be discussed further in Chapter 9.

Forest Hills/Needham Rail Service

A consultant is currently under contract to the MBTA to produce an Environmental Impact Statement including rapid transit and commuter rail alternatives on the Needham Branch Railroad right-of-way in Boston and Needham.

STUDY METHODOLOGY

Accomplishing the objectives of Phase I (i.e. selecting a small number of transit alternatives for detailed analysis in Phase II) involved work in four general categories:

- 1) Community liaison
- 2) Identification and selection of transit alternatives
- 3) Transit ridership analysis
- 4) Technical analyses required to support selection of transit alternatives

These four work items were conducted simultaneously throughout the study as shown in Figure 1.4. The process required in each of the four areas is described briefly below and elaborated on in subsequent sections of the report.

Community Liaison

The community liaison effort was geared to provide maximum citizen awareness and input in the selection process. Along with day-to-day community contacts, three types of meetings were held throughout Phase I:

- a. Project Working Committee (PWC) meetings were held approximately monthly as shown in Figure 1.4. The Project Working Committee was structured to represent State, City and community concerns throughout the study area. It provided overall study direction by a) assisting in the formulation of regional, community and local goals; b) reviewing the direction and scope of the work; c) determining priority issues of neighborhood concerns; and d) participating in the determination of feasible transit alternatives. All significant decisions concerning study direction were made by the PWC.

- b. Coordination meetings were held on Friday mornings to coordinate the activities of the study participants and gather community input on a more frequent basis. Participants in coordination meetings included local citizens interested in the study and able to attend during the day, agency personnel and consultant staff, with an average attendance of about 15-20 people. Throughout the study, information was reviewed in the coordination meetings prior to presentation to the Project Working Committee.
- c. Frequent meetings were held in neighborhoods throughout the study area to reach and inform the maximum number of people possible. The meetings were usually coordinated with the many neighborhood groups already in existence throughout the study area. Presentations and question-and-answer sessions were normally conducted by the community liaison staff during portions of regular meetings scheduled by these groups.

A more detailed description of the community liaison process is given in Chapter 5.

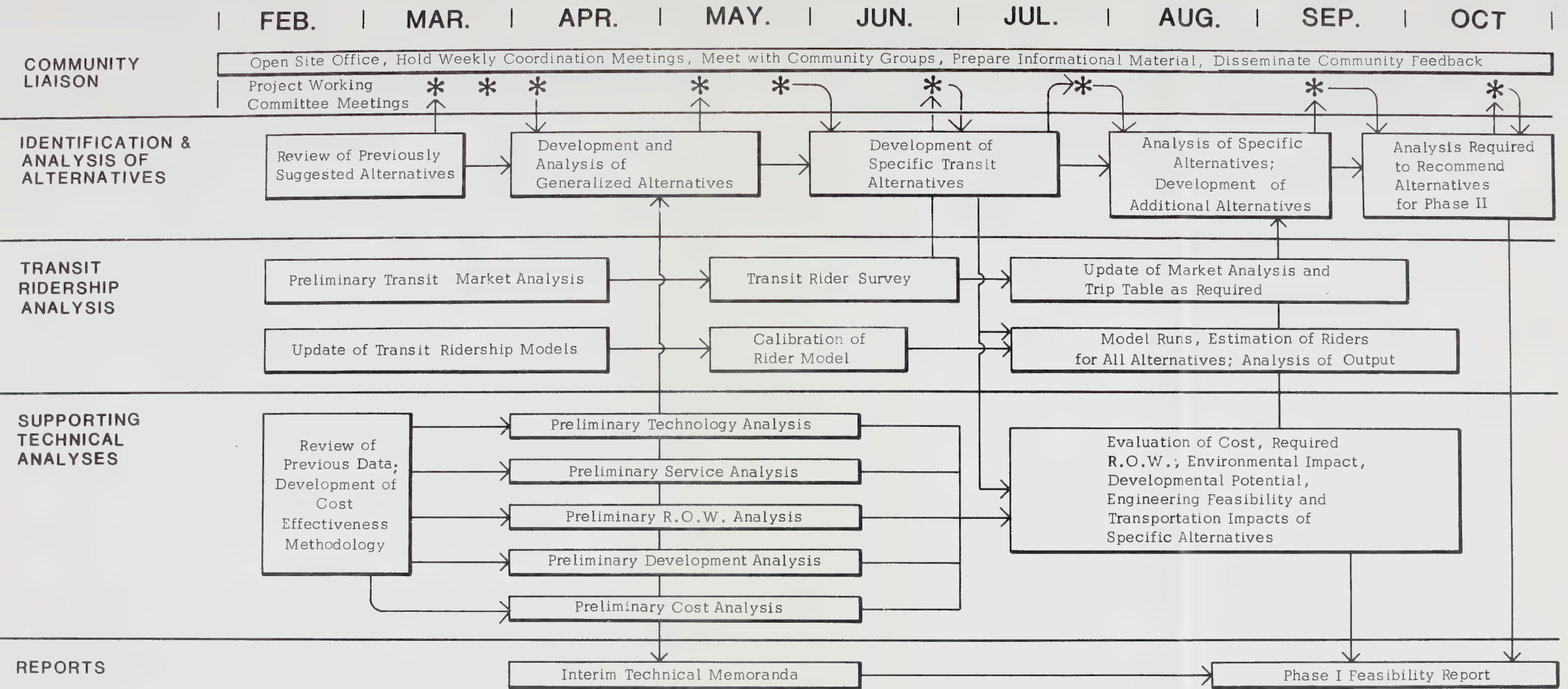
Identification and Selection of Transit Alternatives

The process followed to select transportation alternatives is described in Chapter 9. Suggestions for transit alternatives were available from previous studies, particularly the BTPR. Based on these and input generated during the R/TIS, a variety of transportation modes were examined on three potential alignments, creating a series of "generalized alternatives". The generalized alternatives specified a particular vehicle type running at a given profile on the alignment but did not contain detailed information such as the location of stations and connection to existing services.

Analysis of the generalized alternatives against a number of evaluation criteria (see next section) provided information required to delineate specific alternatives. The specific alternatives were a series of transit systems specified in the detail required to estimate potential riders attracted to the system, potential travel time savings associated with the system, and transit operating costs. Information in these and other areas such as capital cost and community response was generated for the specific transit alternatives, and permitted comprehensive examination of the alternatives measured against the criteria.

Various transit modes and alignments used as part or all of the specific alternatives were then evaluated on a study area-wide basis and within specific "zones of service" which correspond to the four basic areas of the study.

- Zone 1. South End to Dudley Station
- Zone 2. Dudley Station to Grove Hall
- Zone 3. Grove Hall to Mattapan
- Zone 4. Crosstown (Northeastern to Columbia Point)



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STUDY

METHODOLOGY

FIG. 1.4

The alternatives were measured against criteria developed by the consultant based on UMTA guidelines for alternatives analysis and specific issues raised by the Project Working Committee (see Table 1.1). The various criteria were not assigned weights for the purpose of providing a quantitative estimate of the relative value of each alternative; rather, they were used as a checklist to assemble information used to evaluate the alternatives and as guidelines for community review. Alternatives were eliminated early if they presented major problems in meeting certain aspects of the criteria. In later stages, more detailed data in some categories were assembled. Some of the criteria will not be used until Phase II. Decisions made in all stages were based upon community and agency response to the consultant's technical evaluation and recommendations.

Transit Ridership Analysis

Estimates of ridership on the specific transportation alternatives were an important part of Phase I work. Operating characteristics of specific alternatives were defined in detail and computer programs (UMTA's Urban Transportation Planning System package) were run to forecast ridership and other quantitative factors for each alternative. Output in Phase I was primarily used to evaluate the relative cost-effectiveness of the various transit modes and alignments and included:

- a. An estimate of the number of daily transit riders on line-haul services aggregated by line and, in some cases, segments of line
- b. An estimate of new riders attracted to the system (i.e., diversion of transit riders from automobile)
- c. Improvement in travel time over the current transit system

A discussion of the travel forecast data and procedures used to develop ridership data is given in Chapter 4 and in Appendix C. A description of output from the model is contained in Chapter 9.

Supporting Technical Analyses

Various technical analyses were performed throughout Phase I to provide information needed for analysis of transit alternatives. Such analyses were sub-divided into five elements:

- Transit technology analysis (Chapter 7)
- Right-of-way analysis (Chapter 8)
- Service analysis (Chapter 6)
- Land development analysis (Chapters 2 and 9)
- Cost analysis (Chapters 7 and 9)

The technology analysis was used to investigate a wide range of potential transit technologies to sort out those modes not suitable for detailed investigation and to provide data to compare modes that were suitable. The right-of-way analysis investigated major streets and other align-

TABLE 1.1
CRITERIA FOR EVALUATION OF TRANSIT ALTERNATIVES

- A. Community Goals
 - 1. Meets Community Goals
 - 2. Community Acceptance
- B. Transportation Service
 - 1. Replaces Washington St. Elevated
 - 2. Serves Major Commercial Centers
 - 3. Travel Time Improvements *
 - 4. Schedule Adherence
 - 5. Comfort
 - 6. Safety
 - 7. Security
 - 8. Transfers *
 - 9. Service to Elderly and Handicapped
 - 10. Speed of Implementation
 - 11. Impact on Other Transportation Services
 - 12. Potential for Incremental Construction, Future Upgrading, and Expansion
- C. Technology and System Compatibility
 - 1. Proven Technology
 - 2. Compatibility with MBTA Equipment
 - 3. Compatibility with MBTA Labor Practices
- D. Cost-Effectiveness
 - 1. Capital Cost *
 - 2. Cost per Transit Rider *
 - 3. Ratio of Cost to Travel Time Savings *
- E. Environmental Factors
 - 1. Required Takings of Land/Structures/Parks/Historical Sites
 - 2. Impact on Pedestrians/Bicycles
 - 3. Neighborhood Disruption/Cohesion
 - 4. Construction Disruption
 - 5. Noise Impacts *
 - 6. Air Pollution *
 - 7. Energy Consumption *
- F. Land Use/Land Development
 - 1. Impact on Existing and Proposed Land Uses
 - 2. Enhancement of Land Development Goals
 - 3. Impact on Land Values

* Quantitative Factors

ments for transit system potential and identified problems associated with implementing transit on these rights-of-way. The service analysis looked at current rail and bus transit service to identify deficiencies and potential short or long range improvements. The land development analyses examined the relative impact of transit modes and alignments on the development of land in the study area. The cost analysis provided preliminary data on transit capital and operating cost for use in investigating the relative cost-effectiveness of the transit alternatives.

DEVELOPMENT OF RECOMMENDATIONS

Various transit modes and alignments used as part or all of the specific alternatives were evaluated on a study area-wide basis and within specified "zones of service" which correspond to the four basic areas of the study:

- Zone 1. South End to Dudley Station
- Zone 2. Dudley Station to Grove Hall
- Zone 3. Grove Hall to Mattapan
- Zone 4. Crosstown (Northeastern to Columbia Point)

Evaluation of the specific transit alternatives generated information which was used to select transit alternatives for further analysis in Phase II of the Study. The evaluation indicated that there are a number of modes and alignments suitable for transportation improvements in the study area. More detailed analysis, particularly of engineering and right-of-way factors, will be required in Phase II to choose between these modes and alignments.

The transit modes used as part of specific alternatives were analyzed first to determine which modes should be carried into Phase II. Then the specific alignments for each surviving mode were compared in each of the four zones of service, to see which alignments should be analyzed in Phase II. The end result was a selected number of modes and alignments in each zone of service recommended for Phase II analysis.

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2

Study Area Characteristics

CHAPTER 2 STUDY AREA CHARACTERISTICS

INTRODUCTION

This Chapter is intended to provide background for understanding the people and environment most directly impacted by transportation improvements. The area under study is bounded by the Penn Central Mainline right-of-way to the west (to which the Orange Line will be relocated), the Ashmont Branch of the Red Line to the east, the Massachusetts Turnpike to the north and the Neponset River to the south. This comprises a total area of about 9 1/2 square miles (approximately one-quarter of the total land area of the City of Boston) and a population of 215,000 (one-third of the City of Boston).

The study area consists of all or part of seven planning districts as defined by the Boston Redevelopment Authority (BRA). Within the seven planning districts there are also numerous sub-areas as shown in Figure 2.1.

Table 2.1 describes some of the socio-economic characteristics of each planning district as tabulated in the 1970 U.S. Census. These data indicate considerable variation between neighborhoods. However, some general observations can be made. The study area contains the lowest income areas in the City of Boston and overall has a median income 12 per cent lower than the City as a whole. Its proportion of black residents is 43 per cent compared to 16 per cent for the City and in fact, contains about 90 per cent of Boston's black population. The percentage of Spanish speaking residents is only slightly higher than the average for Boston, but some sections in the South End, Roxbury and Uphams Corner have very heavy concentrations of Spanish-speaking individuals. The overall percentage of owner-occupied dwelling units is about the same as the entire

TABLE 2.1
SOCIO-ECONOMIC CHARACTERISTICS OF STUDY AREA (1970)

<u>Planning District</u>	<u>Median Family Income</u>	<u>Percent Black</u>	<u>Percent Spanish Speaking</u>	<u>Percent Owner Occupied</u>	<u>Population Change 1960-1970</u>
South End	\$6,100	39	7	11	-34%
Roxbury	\$6,300	82	6	17	-28%
Uphams Corner	\$7,600	30	7	24	+15%
Franklin Field	\$6,000	74	4	19	+2%
Field's Corner	\$9,200	11	2	34	+2%
Mattapan	\$9,500	25	2	35	+9%
STUDY AREA	\$8,000	43	4	24	-12%
CITY OF BOSTON	\$9,100	16	3	25	-8%

Source: 1970 U.S. Census of Population and BRA District Profiles

City, but there is considerable fluctuation between neighborhoods. Population declined considerably in the South End and Roxbury neighborhoods between 1960 and 1970 while increasing in Mattapan and Uphams Corner.

It is important to note that the area is changing rapidly and that much of the 1970 data is out-of-date. For example, the South End has seen considerable housing construction and rehabilitation since 1970 and has thus experienced increases in both population and percentage of owner-occupied dwellings. Another change is a probable overall increase in the number of black residents, particularly in the Franklin Field and Mattapan areas.

A discussion of the planning districts and their sub-areas is given in the sections which follow. Further detailed information concerning the characteristics of districts and neighborhoods in the study area can be obtained from the district profiles of the Neighborhood Improvement Program prepared and updated periodically by the Boston Redevelopment Authority.

STUDY AREA PLANNING DISTRICTS

South End

The South End is the planning district in the study area closest to downtown and has been undergoing an extensive program of urban renewal and rehabilitation over the past decade. Five new parks, 4,900 new or rehabilitated housing units for all income ranges, new commercial and industrial developments, new institutional uses, a new community school and extensive street and utility work have been completed. More than \$90 million in local, state and federal aid has been spent on renewal activities. This has helped to stimulate considerable private investment, primarily for rehabilitating the area's residential townhouses. The South End Project Area Committee (SEPAC) comprised of local residents, has been delegated considerable power in determining future development in the urban renewal area. The neighborhood's Hispanic community has developed a major parcel, "Villa Victoria", between Tremont Street and Shawmut Avenue.

The area is a contrast between the new and rehabilitated residences to the west of Washington Street and the older residential and industrial uses to the east. The South End contains three commercial concentrations: Tremont Street (between Harvard and W. Newton), Tremont Street and Massachusetts Avenue and Washington Street at Massachusetts Avenue. Many stores in the latter two areas are vacant and boarded up. The area of the South End east of Harrison Avenue is largely devoted to industrial uses and is also the site of Boston City Hospital and the Boston University Medical Center.

**BRA
PLANNING
DISTRICTS**

- Planning District Boundaries
- - - Sub-area Boundaries



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FIGURE 2.1

Roxbury Planning District

Roxbury is the center of Boston's black community, and also contains a large proportion of the area's Hispanic population. Sub-areas in the Roxbury Planning District include Lower Roxbury, Highland Park, Sav-Mor and Washington Park. Lower Roxbury includes the study area's largest business district at Dudley Station and the new Madison Park High School. The Lower Roxbury Community Corporation (LRCC) has been constructing a considerable number of housing units in the area near Madison Park High School and Dudley Station.

Highland Park contains two historical squares with good potential for rehabilitation, Eliot Square and Kitteridge Square. The topography of the area offers some good views of downtown Boston. The Roxbury Action Program (RAP) has planned redevelopment projects near Eliot Square. The Sav-Mor area is a long triangular area bounded by Blue Hill Avenue, Warren Street and Dudley Street. Commercial frontage on Blue Hill Avenue is now mostly vacant and deteriorated. The Washington Park area is immediately west of Sav-Mor and underwent a program of urban renewal during the sixties and early seventies. The area contains over 500 acres and about 50 per cent of Roxbury's residents. The renewal program produced substantial new housing, improvements to neighborhood facilities and rehabilitation of housing.

Uphams Corner (Dorchester) Planning District

Of the five sub-areas in the Uphams Corner district, only Columbia Point and a small portion of Columbia-Savin Hill are outside of the study area. The other sub-areas include Uphams Corner-Jones Hill, Dudley and Brunswick King.

The Columbia-Savin Hill neighborhood is the largest and most stable in the District. Almost 75% of the homes are owner-occupied two and three family dwellings. Overall housing conditions are good with only 14.4% of the above buildings found in 1973 to be in need of repairs in excess of \$1,000.

The Uphams Corner-Jones Hill sub-area has the Uphams Corner business district as its focal point. The majority of dwelling units in the neighborhood are in one, two and three family structures, and housing is reasonably stable. The Brunswick-King sub-area is located to the southwest of Uphams Corner between Blue Hill Avenue and the Midland Branch Railroad. This area is the least stable in the district and the second poorest in terms of median income. It and the Dudley sub-area to the north have experienced dramatic changes during the past three decades. Housing has declined in the Dudley neighborhood because of a number of factors including ownership patterns, structure type, proportion of owners and renters, and lending patterns. The Dudley neighborhood was part of the Model Cities program during 1969 - 1974.

Franklin Field Planning District

The Franklin Field Planning District is located north of Mattapan between Franklin Park and the Midland Branch Railroad. Sub-areas within the district include Woodrow-Morton, Franklin Field South, Franklin Hill-Harvard, and Columbia-Blue Hill. Woodrow-Morton has a high rate of owner occupancy and most buildings are in good condition, although the problem of abandonment has increased in recent years.

The Franklin Field South and Franklin Hill-Harvard neighborhoods suffer from a higher rate of housing abandonment and have a lower median income than Boston as a whole. Homes are mostly two and three family structures. There are nearly 1,000 apartments in the Boston Housing Authority Project at Franklin Field. There are several unfinished "infill" housing structures left over from that aborted program.

The Columbia-Blue Hill area has experienced demographic changes similar to other neighborhoods in the planning district as younger families with children have replaced the older population. Housing is largely one, two and three family dwellings, mostly owner-occupied, although there are some apartment buildings on Blue Hill Avenue, Columbia Road and Washington Street.

Fields Corner (Dorchester) Planning District

Approximately one-half of the Fields Corner (Dorchester) Planning District is located within the study area. This district has a wide variety of characteristics, but tends to have more children, a more stable population, higher average incomes and fewer poverty level families than the City as a whole. The area contains predominantly single to three family housing and a high percentage of home ownership. The Ashmont Branch of the MBTA's Red Line traverses the area with areas west of the Red Line being located within the delineated study area. The northeast portion of this planning district (all within the study area) was included in the Boston Banks Urban Renewal Group Mortgage program which operated until 1972. This program, funded by FHA with the cooperation of financial institutions and the City, was intended to improve the quality of housing stock through rehabilitation and owner occupancy; unfortunately, it had an adverse impact on the area. Excessively low down payments for homes, lack of information about needed repairs, and other problems (including the national recession) caused a high rate of foreclosures, abandonment and subsequent demolition. There is, however, substantial strength throughout most of the Fields Corner District.

Mattapan Planning District

Mattapan is located at the southernmost part of the study area and is centered upon the major commercial center at Mattapan Square. It is bordered by institutional uses (a hospital and cemeteries) on the west, the town of Milton on the south and Dorchester to the north and east. It is bi-

sected by Blue Hill Avenue. The northern sub-area in Mattapan is known as the Wellington Hill due to its topography. This area has experienced substantial abandonment due to mortgage foreclosures (primarily by HUD) and is now a designated Urban Homesteading area.

Western Mattapan is a newer Boston neighborhood, being largely less than 40 years old. Eastern Mattapan on the opposite side of Blue Hill Avenue is a stable area in good condition and contains a variety of ethnic groups. Both Eastern and Western Mattapan have experienced some abandonment due to HUD foreclosures.

Jamaica Plain Planning District

The Egleston Square/Stoneybrook sub-area of the Jamaica Plain Planning District is within the study area. This is a residential area but also includes the major portion of Jamaica Plain's industrial area. Housing is primarily in two and three family dwellings with a scattering of single family dwellings and apartments. Rehabilitation efforts are underway, but the Washington Street El and portions of the industrial district are a blighting influence on some residential neighborhoods.

STUDY AREA LAND USE

The existing land uses within the study area are shown generally in Figure 2.2 and described below.

Residential

The study area is predominantly residential, mostly in the form of two and three story detached, semi-detached and attached structures. Portions of Dorchester and Mattapan have large numbers of single family homes.

In general the density of housing is higher in the northern portion of the study area with row housing and semi-detached units predominating, and lower in the southern portion (South Dorchester and Mattapan) with detached housing predominating. Roxbury, with large areas of vacant land, has the lowest overall population density.

As shown in Table 2.2, the approximate average population density for the study area is 36 persons per acre. This is gross residential density which includes all land areas except for major industrial and recreational areas. As a comparison with some other primarily residential neighborhoods in Boston: there are 61 persons per acre in Charlestown and 34 persons per acre in Brighton. A map showing population density throughout the study area is given in Figure 2.3.

TABLE 2.2
1975 POPULATION DENSITY

<u>Planning District</u>	<u>Persons Per Acre</u>
South End	59
Roxbury	29
Uphams Corner (Dorchester)	39
Franklin Field	48
Field's Corner (Dorchester)	36
Mattapan	32
Jamaica Plain	27
STUDY AREA	36
CITY OF BOSTON	27

Source: 1975 State Census

Commercial

Retail outlets are scattered throughout the study area along the major thoroughfares and especially at their intersections. The intersections of the major streets form the major nodes of commercial activity, including Dudley Station, Uphams Corner, Codman Square, Grove Hall, Mattapan Square and Fields Corner. The amount of commercial floor space at the major centers is shown in Table 2.3. Rapid transit and buses serve Dudley Station and Fields Corner, particularly Dudley, which is the largest shopping center in the study area. Mattapan Square is served by a light rail vehicle connecting to the Ashmont rapid transit station. A lesser degree of transit service is provided to the other commercial areas. Blue Hill Avenue has a long line of commercial frontage built up when trolley service existed but which is now largely deteriorated and vacant.

TABLE 2.3
MAJOR COMMERCIAL CENTERS

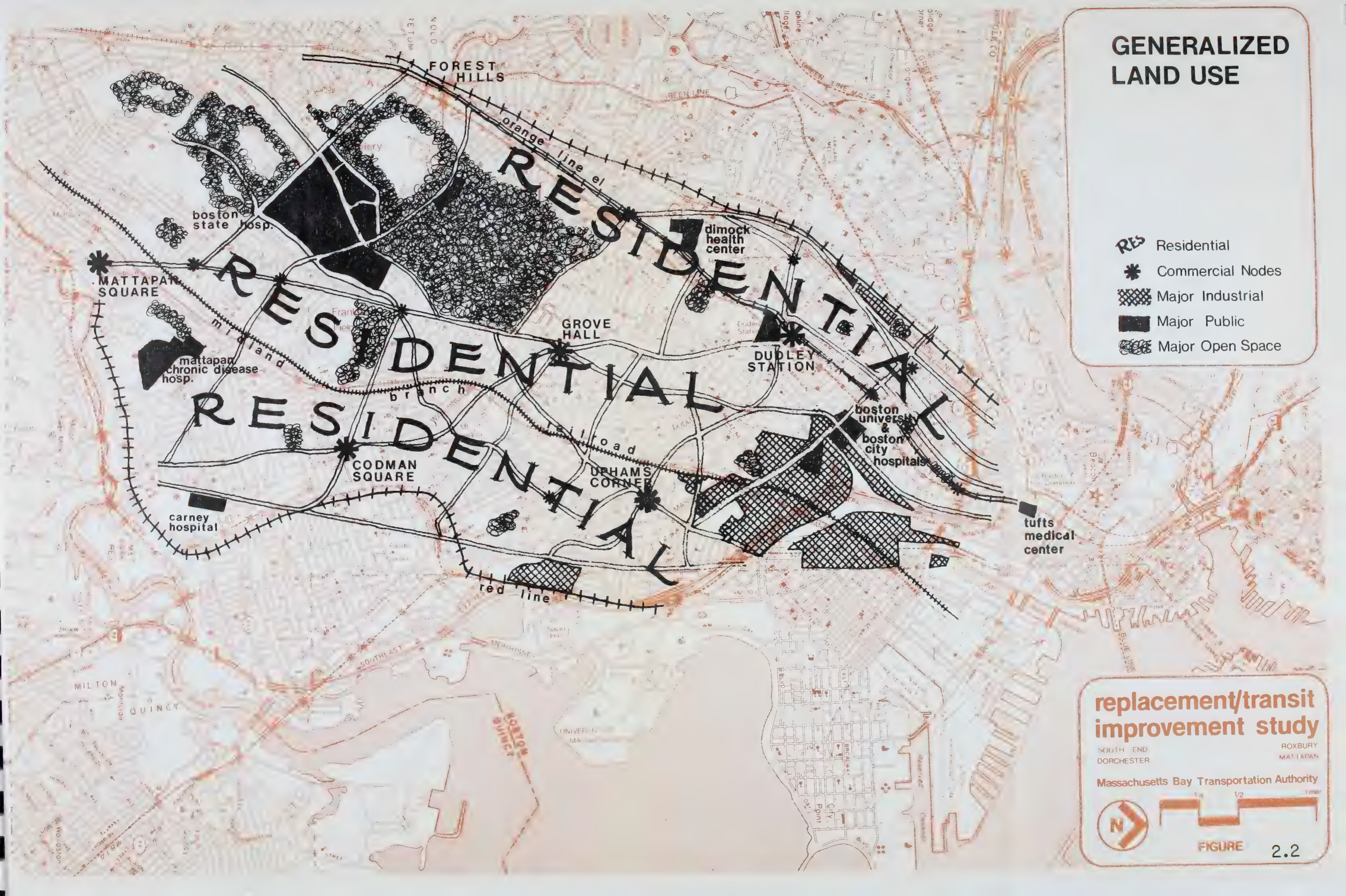
<u>Commercial Center</u>	<u>Number of Occupied Stores</u>	<u>Commercial Floor Area Square Feet</u>	<u>Per Cent Vacant</u>
Dudley Station	100	611,000	2%
Uphams Corner	94	421,000	14%
Field's Corner	120	200,000	*
Grove Hall	78	320,000	5%
Egleston Square	29	120,000	7%
Codman Square	98	325,000	*
Mattapan Square	96	400,000	1%
Morton/Blue Hill	*	175,000	38%

* Data not available

Source: Boston Redevelopment Authority Survey in 1977

GENERALIZED LAND USE

- RES Residential
- * Commercial Nodes
- Major Industrial
- Major Public
- Major Open Space



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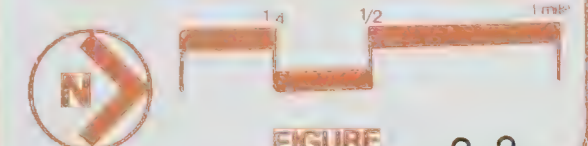


FIGURE 2.2

POPULATION DENSITY

- 7-29 persons per acre
- 30-44
- 45-60
- 61 and over

source: 1975 State Census

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FIGURE 2.3

Industrial

Manufacturing activity is concentrated in the northeast portion of the study area in the vicinity of Massachusetts Avenue, the Midland Branch Railroad and the Southeast Expressway. Smaller industrial areas are located further south, alongside the Southeast Expressway near Savin Hill and in loft space near Dudley Station. There is a scarcity of major industrial areas in the area and consequently a need for transportation access to employment centers outside the area. However, this problem will be alleviated somewhat through construction of the Crosstown Industrial Park (see last section of Chapter 2) and other industrial uses developed in the Southwest Corridor.

Institutional

Institutional uses are scattered throughout the study area mostly as schools and fire, police, governmental and health care buildings. A major concentration of institutional activities is located at Dudley Station where a Civic Center includes the District 2 Police Headquarters, a municipal courthouse, a library and the Boy's Club. Three major hospital complexes are in the area: Tufts New England Medical Center in South Cove, the Boston University and Boston City Hospitals to the north near the Massachusetts Avenue exit of the Southeast Expressway, and the Boston State Hospital-Shattuck Hospital complex in the southern portion near Franklin Park. Smaller hospitals include the Mattapan Chronic Disease Hospital and St. Elizabeth's Hospital in Uphams Corner.

Open Space

Local playground and parks are scattered throughout the study area while Franklin Park and its nearby cemeteries provide major open space in the study area. Franklin Park is a major urban park that has great potential as an asset to the City of Boston as well as to its immediate environment. Besides passive recreation areas, it contains the City's zoo, a golf course and a number of ballfields. Major rehabilitation measures are planned for the zoo which would increase its attractiveness and generate a need for improved public and private transportation access. Currently the zoo is served by two bus routes and has limited parking for automobiles.

Vacant Land

The land cleared for the proposed Inner Belt and Southwest Expressway in the South End, Roxbury and Jamaica Plain areas, while presently open, is slated for future development. There are also numerous vacant lots scattered throughout the study area, resulting from housing abandonment and demolition.

Transportation

Major thoroughfares and mass transportation facilities serving the study area are described in detail in Chapter 3. Major land areas now devoted to transportation other than streets include the Midland Branch Railroad and Red Line Ashmont Branch right-of-way.

The only railroad within the study area is the Penn Central Midland Branch which is presently utilized only for freight traffic on a very limited basis but will be used on an interim basis for commuter and intercity rail service during construction of the relocated Orange Line.

ZONING

The existing land uses in the study area generally reflect current zoning (see Figure 2.4). There appears to be an overzoning of arterial street frontages for business use, which is probably a carryover from the streetcar era. The BRA district planners have expressed the objective of encouraging stronger development at commercial nodes and reducing strip commercial zoning. The role of zoning in implementing desired development patterns will be an important element of Phase II analysis.

URBAN RENEWAL AREAS

There are five urban renewal areas within the study area; a sixth is located on its northernmost corner (see Figure 2.5). These include the South End, Campus High, Kittredge Square (of historic interest), Washington Park and Brunswick-King. Urban renewal efforts in the study area are credited with various degrees of success toward neighborhood improvement, and while the cessation of federal categorical grants has ended the target efforts in these areas, their plans have been assimilated at a reduced level into the Neighborhood Improvement Program and the Housing Improvement Program which are funded by the annual block grant program. The Model Cities program operated within a large portion of the study area during the 1969-74 period. It was largely oriented toward social programs for low income families and had relatively little impact on the overall physical environment.

HISTORIC AREAS

Much of the South End is on the National Register of Historic Places, as is Eliot Square, Franklin Park and Eliot Burying Ground in Lower Roxbury. The Washington Street Elevated and stations, the Forest Hills Cemetery, the Roxbury Highlands area, the Winthrop-Waverly-Warren area south of Dudley Square, the Dudley-Hampton Streets area in Lower Roxbury, the Amory Street Worker's House in Jamaica Plain, and five separate areas along Dorchester Avenue have potential for meeting historic places standards (see Figure 2.6).

GENERALIZED ZONING

- Higher Density Housing
- Lower Density Housing
- Commercial
- Industrial

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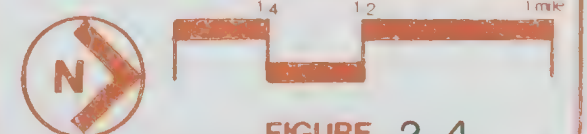
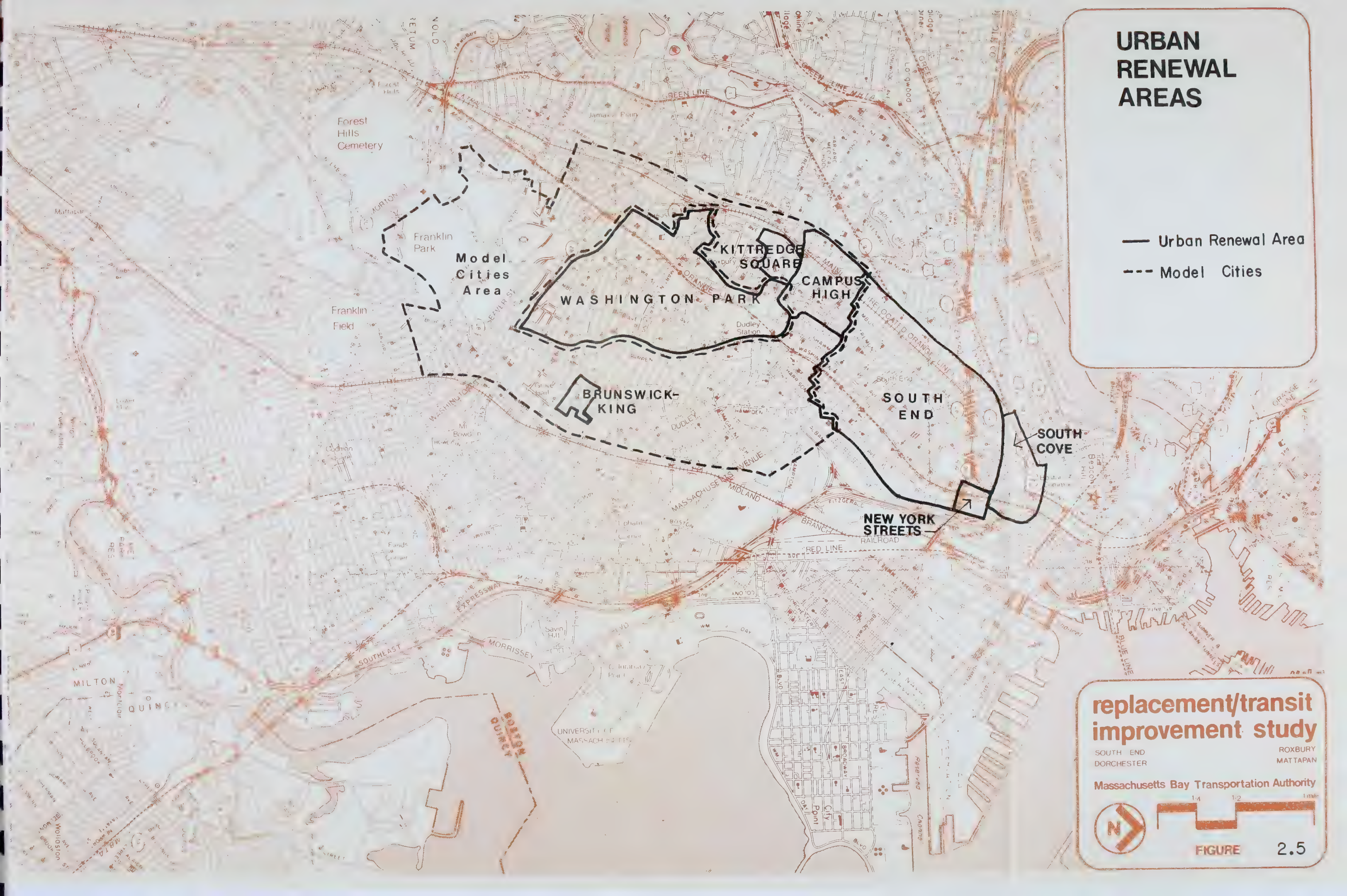


FIGURE 2.4

URBAN RENEWAL AREAS

— Urban Renewal Area
--- Model Cities



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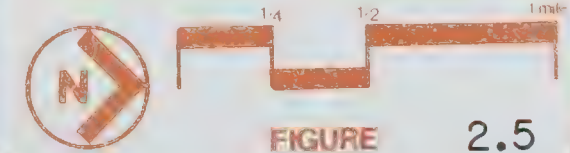




FIGURE 2.5

HISTORIC AREAS

 Areas on the
National Register
of Historic Places

 Areas with
Register Potential

Forest Hills Cemetery
Forest Hills Cemetery
Washington St. El and Stations
Amory Street Worker's House
OLMSTED PARK SYSTEM
Franklin Park
Roxbury Highlands Area
JOHN ELIOT SQUARE DISTRICT
Eliot Burying Ground
Winthrop-Waverley-Warren Area
Dudley/Hampton Streets Area
SOUTH END DISTRICT
2nd Church in Dorchester
Ashmont Hill Area
Roswell Gleason House
Melville Ave. - Wellesley Park Area
Meeting House Hill Area

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FIGURE 2.6

LAND AND URBAN FORM

Urbanization has made the land form difficult to distinguish (Figure 2.7). Beneath the urban form there is the distinct land form characteristic of a series of drumlins (oval hills) that start to appear on a gently rising plain in the middle of the study area in Roxbury, and continue to appear toward the south in Dorchester and Mattapan. However, except for the preservation of the natural character in Franklin Park and the nearby cemeteries, the urban form of a fairly consistent 2 and 3 story, 1, 2 and 3 family residential module, spreads out without any particular regard for the lay of the land beneath. Streets are sometimes laid out to reflect contour lines but just as often they run on a steeply perpendicular line. The occurrence of the strong topographic forms within the urban form lends interest to many of the neighborhoods.

The extensive natural form of Franklin Park and the nearby cemeteries isolates the study area from communities to the west and serves as a reminder of what the virgin land form must have been like. The only water bodies within the study area (excluding the Neponset River) are some small ponds in Franklin Park and the cemeteries.

The residential field changes somewhat in the South End as street walls (brownstones and townhouses without side yards) become stronger and urban development gains intensity as it meets downtown Boston.

Running down the middle of the study area (between drumlins) and respecting the land form because of engineering requirements, is the Midland Branch Railroad. The railroad's very strong linear form parallels Blue Hill Avenue as an urban edge slicing through the common residential field.

GENERAL PROBLEMS AND DEVELOPMENT OBJECTIVES

Two general problems in varying degrees are common to the neighborhoods of the study area - housing deterioration and commercial decline. Specific issues and programs to solve these problems are described in the district profiles of the Neighborhood Improvement Program and are summarized by area below:

South End

- Preservation of the existing housing stock
- Protection against displacement of lower income households
- Improvements to public transportation and reduction in automobile traffic and pollution
- Commercial revitalization compatible with residential use
- Retention and attraction of compatible light industry

Roxbury

- Increase in owner occupancy
- Stabilization of existing subsidized housing projects now in danger of foreclosure
- Upgrading of the Dudley Station and Grove Hall commercial areas
- Increase in employment opportunities
- Improvement to crosstown traffic movement
- Removal of the El and creation of economic opportunities along Southwest Corridor land
- Program for use of vacant land
- Neighborhood maintenance
- Revitalization of John Eliot Square

Uphams Corner

- Reduction in housing abandonment and preservation of housing stock
- Program for use of vacant land
- Maintenance of parks and playgrounds
- Reduction in absentee landlords
- Public works improvements and environmental buffers
- Improvements to Uphams Corner business district
- Reduction in conflicts between industrial and residential use along the Midland Branch Railroad
- More elderly housing in Uphams Corner - Jones Hill neighborhood
- Consolidation of some business areas






Franklin Field

- Reversal of housing abandonment and decline
- Consolidation of some business areas

Fields Corner

- Strategy for protection of housing stock
- Improvement to viable commercial centers including Codman Square, Bowdoin Street and Fields Corner

LAND AND URBAN FORM

-  Significant Topography
-  Open Spaces
-  Residential Field
-  Larger Scale and Non-residential Structures
-  Major Nodes

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FIGURE 2.7

Mattapan

- Stabilization of housing
- Strategy for declining Walk Hill-Blue Hill Avenue node
- Program for use of vacant land
- Maintenance of parks and playgrounds

Jamaica Plain (Egleston Square/Stoneybrook)

- Removal of El
- Availability of mortgage financing
- Housing stabilization and rehabilitation incentives
- Viability of industrial uses and relation to residential areas

Some neighborhoods and sub-areas, especially on the south and eastern fringes and in the northerly urban renewal districts, have been more successful at resisting or arresting the decline and deterioration; other areas have not, due to age, lack of maintenance and poor economic utilization of land and structures. Such neighborhoods are feeling the pressures of disinvestment of capital leading to abandonment of both housing and commercial facilities.

Aside from the general susceptibility to urban decay caused by the reasons cited above, there are other specific areas of concern. Some of these problem areas are along the rough edges between the major industrial area to the north and the abutting residential areas, the vacant "Inner Belt" land and the frontage along Blue Hill Avenue where trolley-generated commercial space is now badly deteriorated. Other areas need upgrading of public facilities and environment including the refurbishment of Franklin Park. The Franklin Park Zoo is now undergoing this type of upgrading.

SIGNIFICANT PLANS

In addition to the efforts directed at combating the general problems mentioned above through the Neighborhood Improvement Program, there are several planning projects being formulated that are of interest.

The state transportation agencies are participating in special efforts to utilize the land previously cleared for I-95 and the Inner Belt for productive transportation and community purposes. In addition to the relocation of the Orange Line to the I-95 corridor, sites for joint development including residential, industrial, commercial and institutional use are being prepared and actively developed.

A new crosstown street connecting the Massachusetts Avenue ramps of the Southeast Expressway to an arterial along the Southwest Corridor (with a reserved transit right-of-way) will utilize a portion of the former Inner Belt right-of-way. The Crosstown Industrial Park near the Washington Street - Crosstown Street intersection is in an advanced stage of planning, with prospective developers already in view. Digital Equipment Corporation, one of Massachusetts' leading employers, is planning a new 125,000 square-foot plant in two phases and will employ about 400 workers, mostly local.

In August of 1977, the City released the so-called "Boston Plan", which described proposed development projects in four of the City's neighborhoods. The plan is intended to coordinate projects in these neighborhoods and facilitate the receiving of federal funds. One of the neighborhoods, the Sav-Mor area of Roxbury, lies in the heart of the study area, while two others, Columbia Point and Hyde Park, are just outside the study area and are directly affected by transportation decisions in the study area.

The project in the Boston Plan most likely to affect the study area is proposed rehabilitation of the Blue Hill Avenue Corridor between Grove Hall and Dudley Street. The plan includes some minor projects for Dudley and Grove Hall commercial centers, a program of residential preservation including refurbishing of the Orchard Park Housing Project near Dudley Station and reconstruction of the Blue Hill Avenue right-of-way.

Columbia Point, while technically outside the study area, is a potential terminus for crosstown transit service which was investigated as part of the R/TIS. Despite grave problems with its 1,500 unit public housing project (only 30% of its units are currently occupied), the area is or will be the location of two major institutions, the 8,000 student UMass campus and the John F. Kennedy Library (expected to attract 600,000 to 800,000 annual visitors). The Boston Plan calls for 1,500 new mixed-income housing units, refurbishing of an almost abandoned shopping center (Bayside Mall) and development of a waterfront recreation area.

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3

Existing Transportation

CHAPTER 3 EXISTING TRANSPORTATION

INTRODUCTION

The study area is served by a variety of public transportation services, including more than thirty MBTA bus routes, the Orange Line to Forest Hills, the Red Line branch to Ashmont, and the Mattapan High Speed Trolley Line from Ashmont to Mattapan. The characteristics of the existing transportation services in the study area are described in the following sections and include the street system, rapid transit and light rail lines, commuter rail, buses and taxicabs.

STREET SYSTEM

The overall street network in the study area is quite fragmented, reflecting the historical growth of Boston by annexing old suburbs such as Roxbury and Dorchester. One limited-access expressway, the Southeast Expressway (I-93), runs on the eastern edge of the study area and into downtown Boston. This expressway is of limited value to residents of the study area because it is both difficult to reach on local streets and is heavily congested during peak periods. The only interchange of real benefit to the study area is located at Massachusetts Avenue. The proposed Crosstown Street will be tying into this interchange and therefore improve expressway access for areas in lower Roxbury and Jamaica Plain. A "diamond lane" for buses and automobiles having three or more persons was tried on an experimental basis on the Southeast Expressway in the autumn of 1977, but has recently been cancelled.

A look at the configuration of major streets in the study area (Figure 3.1) indicates that most major streets in the area are oriented in a north-south (downtown) direction. Major east-west (crosstown) arterials are limited and generally run for short distances only. This limitation hampers automobile and bus movements in the crosstown direction. Daily traffic volumes on major streets in the study area are also shown in Figure 3.1.

RAPID TRANSIT & LIGHT RAIL

Description

The study area is served on its borders by two rapid transit lines (Orange & Red) and one light rail line (Mattapan High Speed Trolley Line).

The Orange Line

The southern half of the Orange Line Rapid Transit extends 4.7 miles from Washington Station in downtown Boston to Forest Hills along Washington Street (Figure 3.2). The line has recently been extended to the

north as far as Oak Grove Station in Malden. The Orange Line is elevated between Essex and Forest Hills with intermediate stations at Dover, Northampton, Dudley, Egleston and Green. These stations are spaced at an average of 2/3 mile and the key Dudley and Egleston stations in Roxbury are located more than one mile apart.

The Orange Line between Essex Station and Forest Hills is the oldest high platform line in the MBTA system. The elevated section from Dudley Station to a point near Herald Street north of Dover Station opened in June 1902. Originally the line extended from that point into downtown Boston via the Tremont Street subway of the Green Line. The present Washington Street tunnel and connecting ramp to the elevated at Herald Street were completed in 1908, and Orange Line cars were then diverted to this route. The final section from Dudley Station to Forest Hills station was placed in operation during November, 1909.

The southern end of the Orange Line, from Dover Station to Forest Hills, has always been heavily dependent on feeder modes for collection and distribution of its riders. When the line first opened, feeder service was provided by streetcar routes, many of which pre-dated the elevated. A streetcar line even ran under the elevated along Washington Street to help compensate for the wide station spacings overhead. From its opening date until the late 1920's, the Orange Line served most of Dorchester via connecting streetcar service but, with the completion of the Red Line to Ashmont in 1928, many of the Dorchester feeder routes were re-oriented to serve the Red Line, leaving the Orange Line with a reduced service territory to the east.

The Orange Line south of Essex Station will be relocated to the mainline railroad right-of-way, with service expected to begin in 1983. The Washington Street elevated will remain in operation until that time. New stations will be located at South Cove, Back Bay Station, Massachusetts Avenue, Ruggles Street, Roxbury Crossing, Jackson Square, Boylston Street, Green Street and Forest Hills. Station spacing for this section of the line will average slightly more than one-half mile.

The Red Line

The Rapid Transit Red Line south of South Station provides service on two branches: Ashmont and Quincy. The Ashmont Branch includes seven stations, spaced an average distance of three-quarters of a mile, located at Broadway, Andrew, Columbia, Savin Hill, Fields Corner, Shawmut and Ashmont.

Initial construction of the Red Line took place after the Orange Line; consequently, this line has superior engineering standards. The first section was opened from Harvard to Park Street in 1912. The line

TRAFFIC VOLUMES ON MAJOR STREETS

ALL NUMBERS INDICATE
AVERAGE DAILY
TWO-WAY TRAFFIC



replacement/transit improvement study

SOUTH END
DORCHESTER

ROXBURY
MATTAPAN

Massachusetts Bay Transportation Authority

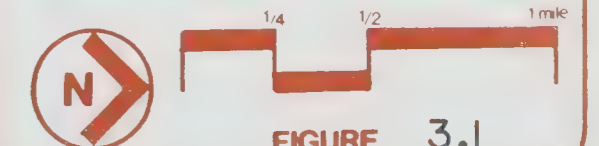


FIGURE 3.1

EXISTING RAPID TRANSIT, LIGHT RAIL AND COMMUTER RAIL LINES

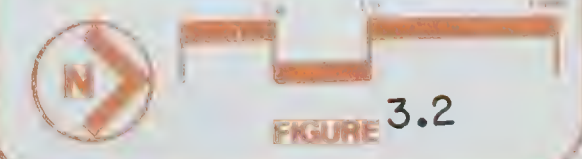
- Rapid Transit
- - - Light Rail
- + + + Commuter Rail



replacement/transit improvement study

SOUTH END
DORCHESTER

Massachusetts Bay Transportation Authority



was extended in several stages, finally reaching the Ashmont terminal in 1928. From east of Charles Street to Andrew the line is in subway. From south of Andrew to Fields Corner the line is at-grade on private right-of-way, and from south of Fields Corner to Ashmont it is in a decked-over cut. The Quincy Branch provides non-stop service south of Andrew Station to the three Quincy stations and hence is of limited value to residents of the study area.

Ashmont-Mattapan High Speed Line

As an extension of the Red Line beyond Ashmont, the Mattapan High Speed Trolley Line provides grade-separated light rail services to Lower Mills, Mattapan and Milton between Ashmont Station and Mattapan Square. It was a former commuter rail line that was converted to a trolley line in 1929. The line has eight stations spaced at an average of 1/3 mile. Free transfer is permitted at Ashmont Station, allowing riders from Mattapan a single fare ride into downtown.

Rail Transit Service

Frequency of service (headways) for both Orange Line and Ashmont Red Line and Ashmont - Mattapan High Speed Lines are shown in Table 3.1.

TABLE 3.1
FREQUENCY OF SERVICE ON RAIL TRANSIT LINES

<u>Line</u>	Headway (minutes)				
	<u>Peak</u>	<u>Day</u>	<u>Evening</u>	<u>Saturday</u>	<u>Sunday</u>
Orange Line	5	8	15	8/9	15
Red Line (Harvard-Ashmont)	6	10	10/15	10/15	15
Ashmont-Mattapan High Speed Line	3	8	15	8/15	15/30

Source: MBTA Fall 1977 Schedule

Generally the MBTA runs four-car rapid transit trains at peak hours and two-car trains at other times. The Mattapan line has two-car PCC (trolley) trains during peak hours and one-car trains at other times.

Headways maintained by the MBTA for its rapid transit lines are influenced considerably by the number of vehicles that are operational for daily service requirements. Difficulty in maintaining an adequate fleet of vehicles for daily service needs has led to frequent over-crowding during peak periods. However, the MBTA plans to receive 120 new Orange Line vehicles to replace all existing vehicles during calendar year 1979, and to initiate major renovation of the entire Harvard-Ashmont fleet of 88 "Bluebirds" during calendar year 1977. The acquisition and renovation of these vehicles should produce service headways that will reduce over-crowded conditions during peak

periods. It should be noted that the presence of two branches on the Red Line makes it difficult to reduce Ashmont or Quincy Branch headways much below the six minutes currently scheduled.

Scheduled travel times to downtown on both Orange and Red Lines are shown in Table 3.2.

TABLE 3.2
SCHEDULED RAPID TRANSIT TRAVEL TIMES FROM DOWNTOWN

<u>Orange Line</u>		<u>Red Line (Ashmont-Harvard)</u>	
<u>(From Washington to:)</u>	<u>Cumulative Run Time (Minutes & Seconds)</u>	<u>(From Park To:)</u>	<u>Cumulative Run Time (Minutes & Seconds)</u>
Essex	1-20	Washington	1-05
Dover	3-40	South Station	2-15
Northampton	5-55	Broadway	4-15
Dudley	8-10	Andrew	6-10
Egleston	11-55	Columbia	8-10
Green	13-40	Savin Hill	10-25
Forest Hills	15-40	Fields Corner	12-05
		Shawmut	13-30
		Ashmont	14-40

Trips from Forest Hills Station to Downtown (Washington Street) presently take nearly 16 minutes, achieving an average speed of slightly more than 18 m.p.h. As a comparison, trips from Ashmont Station to Park Street Station take nearly 15 minutes with an average speed of almost 24 m.p.h. The lower overall speeds on the Orange Line are primarily due to speed restrictions imposed by the MBTA due to the conditions and generally poor horizontal alignment of the elevated structure, particularly near Dudley Station.

Rapid Transit Ridership

Annual rapid transit boardings for each of the twelve most recent years are shown in Table 3.3. The rapid transit ridership data were obtained from MBTA monthly rapid transit revenue reports which tabulate revenue by line and station on a daily and monthly basis. The values obtained were adjusted to account for the use of prepaid passes.

The Orange Line experienced a patronage decline of 33 per cent during the period 1965 - 1976 compared to declines of 13.5 per cent for the Red Line (including the Quincy Branch) and 13 per cent for all MBTA transit lines.

TABLE 3.3
RAPID TRANSIT RIDERSHIP (1965 - 1976).

Annual Riders (Millions)

<u>Year</u>	<u>Orange Line</u> <u>(Forest Hills to Everett)</u>	<u>Red Line</u> <u>(Harvard to Ashmont)</u>	<u>All MBTA</u> <u>Rapid Transit</u>
1965	39.4	28.0	103.0
1966	39.2	28.5	104.8
1967	39.7	29.4	106.2
1968	39.6	29.0	105.2
1969	38.8	28.4	104.2
1970	37.5	28.3	103.0
1971	35.4	26.9	98.5
1972	34.2	25.8	96.1
1973	32.5	24.7	99.8
1974	30.3	25.7	98.3
1975	26.2	24.5	91.5
1976	26.2 *	24.2	89.7

* Includes new service to Malden Station

Source: CTPS Market Analysis Memorandum

The decrease was particularly marked for stations in the study area as shown in Table 3.4. Daily boardings at Orange Line stations in the study area decreased by 33 per cent between 1965 and 1975 while Ashmont Branch riders decreased by 38 per cent in the same period. Both lines were affected by population and economic decline in the study area and fear of increased crime. The decline in ridership on the Ashmont Branch was accelerated in 1972 because of competition from the Quincy Branch.

TABLE 3.4
RAPID TRANSIT STATION BOARDINGS 1965 - 1975

Two Way 24-Hour Passenger Boardings

<u>Year</u>	<u>ORANGE</u> <u>LINE</u>	<u>Forest</u>		<u>Egle-</u>		<u>North-</u>	
	<u>SOUTH</u> *	<u>Hills</u>	<u>Green</u>	<u>ston</u>	<u>Dudley</u>	<u>ampton</u>	<u>Dover</u>
1965	47,700	17,000	2,200	5,800	13,200	4,400	4,300
1966	47,100	17,800	2,100	5,800	12,900	4,200	4,300
1967	46,200	17,300	2,200	5,400	12,500	4,200	4,600
1968	41,400	16,100	1,900	4,900	10,600	3,700	4,200
1969	43,300	16,000	2,100	5,700	11,200	4,100	4,200
1970	39,200	15,000	1,800	5,100	10,300	3,700	3,300
1971	39,700	15,500	1,900	5,400	9,500	4,000	3,400
1972	37,500	14,100	1,800	5,000	9,000	3,900	3,700
1973	35,800	13,300	1,700	4,800	8,500	3,900	3,600
1974	30,500	10,600	1,500	4,000	7,600	3,700	3,100
1975	29,600	10,200	1,700	3,900	7,200	3,600	3,000

* Forest Hills to Essex

TABLE 3.4 CONT.

Two Way 24-Hour Passenger Boardings

Year	RED LINE ASHMONT						
	<u>BRANCH*</u>	<u>Ashmont</u>	<u>Shawmut</u>	<u>Fields Corner</u>	<u>Savin Hill</u>	<u>Columbia</u>	<u>Andrew</u>
1965	46,200	18,900	2,300	10,000	2,500	6,900	5,600
1966	46,800	19,100	2,400	10,500	2,400	6,500	5,900
1967	47,900	19,500	2,400	10,800	2,500	6,400	6,300
1968	45,000	18,400	2,200	9,700	2,700	6,400	5,600
1969	44,400	19,200	2,300	9,000	2,600	5,000	6,300
1970	43,700	19,100	2,200	9,200	2,400	5,300	5,500
1971	38,200	16,200	2,000	7,000	2,600	4,600	5,800
1972	35,500	14,800	2,100	6,200	2,300	4,500	5,600
1973	31,300	12,900	1,900	5,500	2,300	3,600	5,100
1974	31,200	11,200	1,700	5,300	2,200	6,500	4,300
1975	26,900	9,800	1,600	4,800	2,000	4,600	4,100

* Ashmont to Andrew

Current daily ridership on the Ashmont-Mattapan High Speed Line is approximately 11,500 (inbound plus outbound). This has decreased 12 percent since 1964, with most of the decline coming when the Red Line was extended to Quincy.

COMMUTER RAIL

Daily commuter rail service is provided from the suburbs southwest of Boston to Back Bay and South Stations. The service is provided along four routes and is operated by the Boston and Maine Corporation under contract to the Massachusetts Bay Transportation Authority. These routes originate in Providence, Stoughton, Franklin and Needham. The Providence, Stoughton and Franklin services join south of Readville and travel the former Penn Central mainline railroad to Forest Hills, where they are joined by the Needham Branch. Between Forest Hills and downtown all services are on the mainline tracks and embankment. The line is a part of the Federal Railway Administration Northeast Corridor Project which involves electrification and upgrading of intercity rail between Washington and Boston. Long-distance intercity service from Boston to New York and Washington is operated by AMTRAK.

Outside of South and Back Bay Stations, the only commuter rail station currently located in or near the study area is at Forest Hills. Only the Needham Branch Line provides service stops at Forest Hills. Twelve daily inbound stops and thirteen daily outbound stops are scheduled for Forest Hills with most scheduled stops occurring only on demand of passengers. Boardings at Forest Hills are minimal because of the adjacent rapid transit station and because commuter rail fares are significantly higher than rapid transit fares (\$1.10 versus \$.25 for rapid transit). Characteristics of the Needham, Franklin, Stoughton and Providence Lines are shown in Table 3.5.

TABLE 3.5
COMMUTER RAIL STATISTICS

<u>Line</u>	Average Weekday Boardings (1970)	Route Miles	Station Spacing (miles*)	Average Schedule Speed (mph)	Weekday Round Trips (May, 1977)
Providence "Main Line"	2,100	44.0	3.7	39	11
Stoughton Branch	700	18.9	3.8	32	5
Franklin Branch	1,200	27.6	2.1	29	8
Needham Branch	1,500	13.6	1.2	20	13

* Including Back Bay and South Stations

With the diversion of commuter rail services from the Penn Central Main Line to the Midland Branch, during construction of the Relocated Orange Line, the MBTA will locate three new stations on the line at Fairmount, Morton Street and Uphams Corner. Service to these stations will be approximately every half hour during rush hours and hourly during midday. One-way fares to South Station will be \$.85 from Uphams Corner and \$.95 from Morton Street. Use of a monthly commutation ticket would reduce these fares to \$.55 and \$.63, respectively, with free transfer to all rapid transit lines.

BUS SYSTEM

Routes

An extensive network of surface bus routes (all operated by the MBTA) serves the study area as shown in Figure 3.3. Approximately thirty routes provide local service within the area while others provide service between outlying communities and rapid transit stations located within the study area.

The bus network within the study area is oriented primarily to feed rapid transit facilities. Bus - rail transfers are particularly heavy at certain rapid transit stations such as Dudley, Egleston and Forest Hills on the Orange Line and Mattapan, Ashmont and Fields Corner on the Red Line. Only one bus route (No. 43) provides direct service to downtown Boston. In general, bus routes do not penetrate the downtown area because of narrow streets which produce traffic congestion and provide limited space for loading and unloading passengers.

The South End is served by two cross-town routes (Routes 9 - City Point to Copley and Route 68 - Copley to Boston City Hospital) serving the Back Bay area at Copley Square and the Prudential Center, and two downtown-oriented routes (Route 43 - Egleston to Stuart and Route 49 - Northampton to Kneeland Street). However, crosstown service is hampered by a fragmented street network, and downtown service meets severe traffic congestion north of Kneeland (Stuart) Street.

The Roxbury area is served primarily by routes feeding into Dudley Station from Mattapan and Dorchester and from areas outside the study area from the northwest and west. With the exception of Route 29 (Egleston - Mattapan), Route 43 (Egleston - Stuart) and Route 47 (Central Square - Boston City Hospital), bus services within Roxbury terminate at Dudley Station. Crosstown bus services to the west, such as Route 66 to Brookline and Allston and Routes 1 and 47 to Cambridge terminate at Dudley Station, requiring a bus transfer for all bus passengers from south or east of Dudley who desire access to the west.

Routes serving the Mattapan, Franklin Field and Dorchester areas function primarily as feeder services to rapid transit lines and, to a far lesser extent, as cross-town services for market areas within the study area. Routes serving these neighborhoods provide little direct service to areas beyond the boundaries of the study area.

Service Characteristics

Service characteristics for all routes within the study area are given in Table 3.6. As can be seen from this table, MBTA bus service within the study area begins as early as 4:45 A.M. and extends as late as 2:00 A.M. (Route 1), although generally bus service operates from

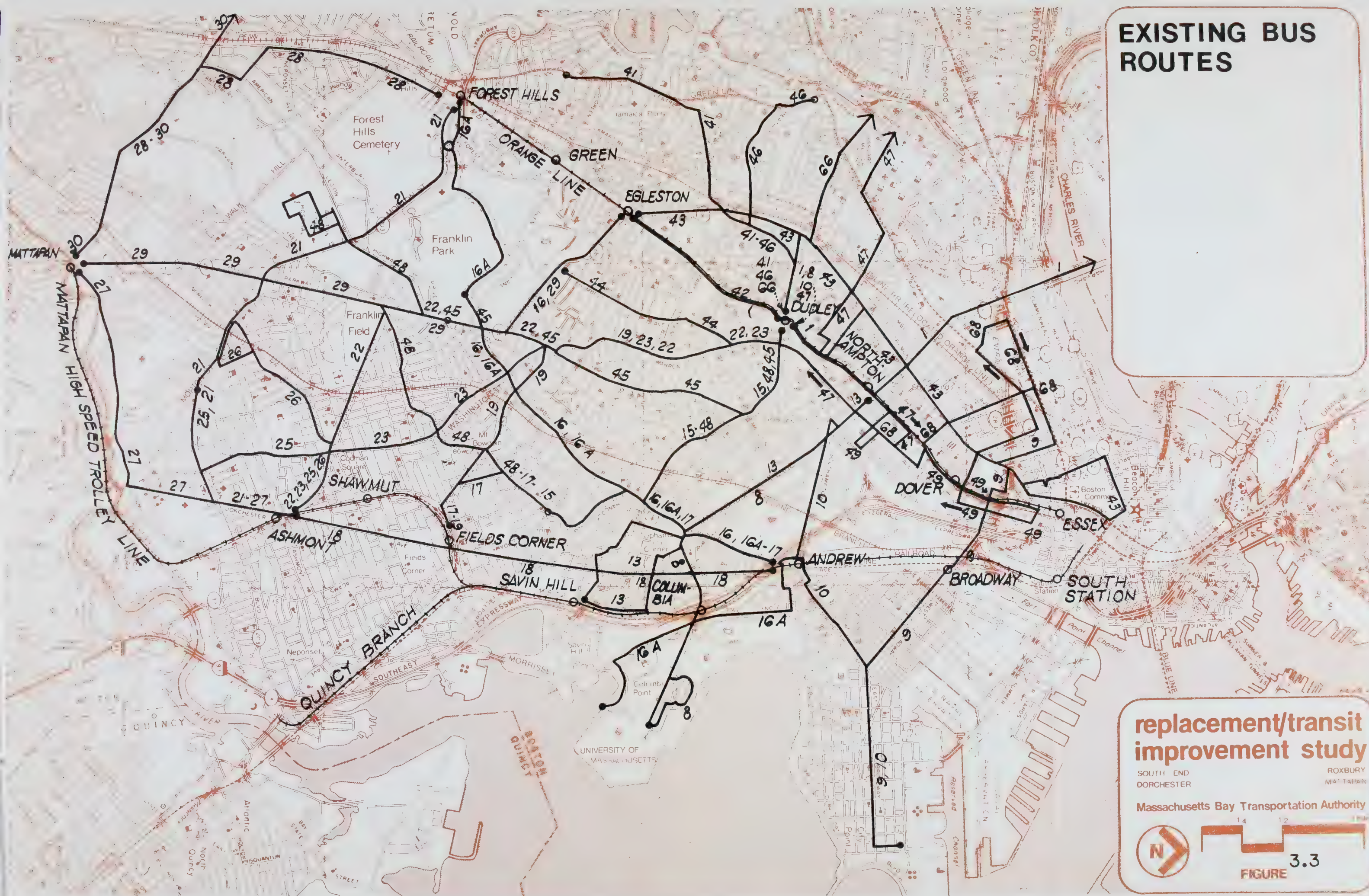
TABLE 3.6
EXISTING BUS SERVICE CHARACTERISTICS

Route	Weekday Hours of Service	Frequency			Weekday Round Trips	Weekday vehicle Miles
		Peak	Midday	Evening		
1 Harvard - Dudley	4:44 AM - 1:24 AM	5	10	20	128	1,066
8 Columbia Pt. - Dudley		15	30	45	40	296
9 City Point - Copley (Tremont & Broadway after 6:00 PM)	5:18 AM - 12:50 AM	8	15	40	82	590
10 City Point - Dudley	4:44 AM - 1:00 AM	10	20	40	66	506
13 Savin Hill - Northampton*	6:30 AM - 6:30 PM	20	40		29	152
15 Kane Sq. - Dudley	5:42 AM - 12:58 AM	8	15	30	89	337
16 Egleston - Andrew (Franklin Park after 6:00 PM also from 9:20 AM - 1:20 PM)	5:33 AM - 12:55 AM	12	20	30	52	337
16A Forest Hills - U. Mass. (Peak period plus several mid-day trips)	6:36 AM - 6:05 PM	25	120	-	12	153
17 Fields Corner - Andrew	4:47 AM - 12:57 AM	9	15	40	75	485
18 Ashmont - Andrew	5:18 AM - 6:55 PM	30	60	-	23	212
19 Fields Corner - Dudley**	7-9 AM, 4:30-6 PM	15	-	-	17	105
21 Ashmont - Forest Hills**	4:38 AM - 6:30 PM	12	25	40	31	273
22 Ashmont - Dudley (via Talbot)	4:45 AM - 1:06 AM	7/10	13	30	93	733
23 Ashmont - Dudley (via Washington)	4:50 AM - 12:57 AM	5/8	13	30	97	718
25 Ashmont - Gallivan Boulevard	5:05 AM - 10:05 PM	12	20	30	51	229
26 Ashmont - Norfolk St.	4:55 AM - 10:05 PM	7	20	30	64	240
27 Ashmont - Mattapan	5:15 AM - 1:00 AM	30	30	60	31	143
28 Arborway - Mattapan**	5:10-9:10, 2:23-6:25	20	30	-	18	132
29 Egleston - Mattapan	5:02 AM - 1:05 AM	9	12	30	129	1,013
30 Roslindale Sq. - Mattapan	5:25 AM - 1:17 AM	20	30	60	40	241
41 Dudley - Centre & Elliot Sts.	5:10 AM - 12:30 AM	10	15	30	97	790
42 Dudley - Egleston	5:14 AM - 11:29 PM	12	22	20	68	182
43 Egleston - Stuart St.	5:00 AM - 12:55 AM	10	15	30	97	790
44 Dudley - Seaver St.	5:14 AM - 12:57 AM	9	12	25	95	308
45 Dudley - Franklin Park	5:01 AM - 12:57 AM	9	12	32	86	440
46 Dudley - Heath & S. Huntington	6:45 AM - 8:45 PM	30	30	30	28	116
47 Central Sq. - City Hospital *	5:00 AM - 11:30 PM	12	20	30	61	657
48 Dudley - Boston State Hospital **	2 Round Trips	60	-	-	2	22
49 Northampton - Kneeland St. *	6:00 AM - 6:15 PM	30	30	-	24	86
66 Dudley - Allston	4:45 AM - 12:57 AM	7	15	30	108	879
68 Copley - E. Concord St. **	7:00 AM - 6:45 PM	15	30	-	32	77

Source: MBTA Spring, 1977 Operating Schedule * No Sunday Service

** No Saturday or Sunday Service

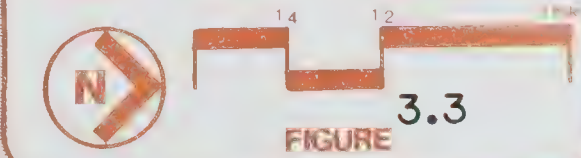
EXISTING BUS ROUTES



replacement/transit improvement study

SOUTH END DORCHESTER ROXBURY MATTAPAN

Massachusetts Bay Transportation Authority



5:00 A.M. until 1:00 A.M. Except for several routes which provide peak period service only or provide limited or no evening service, the majority of routes within the area provide continuous operation throughout the day.

Weekday peak period frequencies range from 5 to 30 minutes, with mid-day frequencies ranging from 10 to 40 minutes. During the evening period, frequencies range from 20 to 60 minutes with the majority of routes averaging evening frequencies of 30 minutes. Route frequencies for week-end service, Saturday and Sunday, generally correspond with the weekday/mid-day frequencies. New schedules are printed four times a year, which permits considerable flexibility for changing routes, but also leads to confusion for the transit user.

Figure 3.4 shows total weekday bus trips plotted on streets throughout the study. It shows the major bus corridors in the area feeding into Dudley, Egleston and Ashmont Stations and indicates the general north-south orientation of bus routes in the study area.

Operating Statistics

Table 3.7 summarizes operating statistics for bus routes within the study area as developed by the MBTA for their Spring, 1977 schedule. The table includes factors such as round trip route miles, operating speed, operating run time, recovery run time, and operating to recovery run time ratios.

Average operating run time is defined by the MBTA as the period within which two-thirds of scheduled bus runs (for a particular time of day) can be completed. Average recovery time includes the average operating run time plus an additional period of time for slower runs and con-

**TABLE 3.7
EXISTING BUS OPERATING CHARACTERISTICS**

Route	Round Trip Miles	Average Operating Speed (m.p.h.)			Average Operating Run Time (minutes)			Average Recovery Time (incl. layover) (minutes)			% Layover/Run Time		
		Peak	Midday	Evening	Peak	Midday	Evening	Peak	Midday	Evening	Peak	Midday	Evening
1 Harvard - Dudley	8.3	8	8	10	60	64	49	71	71	59	18	12	20
8 Columbia Pt. - Dudley	7.3	9	9	11	49	49	53	56	60	60	22	22	13
9 City Point - Copley	7.2	10	10	11	48	48	29	57	61	39	18	26	34
10 City Point - Dudley	7.6	9	10	11	53	48	42	62	62	53	16	28	25
13 Savin Hill - Northampton	5.2	12	12	-	26	26	-	40	38	-	55	48	-
15 Kane Sq. - Dudley	3.7	8	8	10	28	28	22	31	32	29	11	16	33
16 Egleston - Andrew	6.5	11	12	14	40	39	23	47	46	30	16	22	30
16A Forest Hills - U. Mass.	12.2	12	11	-	61	65	-	71	72	-	16	10	-
17 Fields Corner - Andrew	6.5	12	11	14	33	34	27	45	46	38	38	33	40
18 Ashmont - Andrew	9.2	14	13	15	41	42	38	59	58	46	45	39	22
19 Fields Corner - Dudley	6.0	11	-	-	32	-	-	40	-	-	24	-	-
21 Ashmont - Forest Hills	8.8	15	15	-	34	34	-	49	45	-	42	30	-
22 Ashmont - Dudley (via Talbot)	7.8	11	11	12	43	44	37	51	53	46	17	21	22
23 Ashmont - Dudley (via Washington)	7.4	11	11	12	41	41	37	51	55	45	25	33	20
25 Ashmont - Gallivan Boulevard	4.5	9	9	13	28	25	21	35	27	27	22	11	30
26 Ashmont - Norfolk St.	3.7	11	12	13	19	19	19	27	24	28	36	29	50
27 Ashmont - Mattapan	4.6	12	12	13	23	23	22	30	29	29	30	28	33
28 Arborway - Mattapan	7.3	14	-	-	31	-	-	41	-	-	31	-	-
29 Egleston - Mattapan	8.2	13	13	15	38	39	32	50	51	44	29	30	37
30 Roslindale Sq. - Mattapan	6.0	13	12	16	25	27	20	42	41	29	66	54	46
41 Dudley - Centre & Elliot Sts.	5.2	10	11	13	30	29	23	39	36	31	38	22	33
42 Dudley - Egleston	2.7	9	10	11	17	18	15	23	22	20	30	26	35
43 Egleston - Stuart St.	8.1	9	10	12	53	48	40	60	61	55	14	25	37
44 Dudley - Seaver St.	3.2	11	10	12	19	19	15	27	24	20	39	30	30
45 Dudley - Franklin Park	5.1	10	11	13	30	29	24	37	37	31	25	29	31
46 Dudley - Heath & S. Huntington	4.1	12	12	12	21	21	21	29	30	29	39	44	38
47 Central Sq. - City Hospital	10.7	10	10	14	63	64	46	75	82	57	19	29	23
48 Dudley - Boston State Hospital	11.2	15	-	-	45	-	-	48	-	-	6	-	-
49 Northampton - Kneeland St.	3.6	9	8	-	28	27	-	33	31	-	14	12	-
66 Dudley - Allston	8.1	10	9	12	51	53	39	62	65	56	22	21	41
68 Copley - E. Concord St.	2.4	5	5	-	27	27	-	32	31	-	15	15	-

Source: MBTA Summary Table of Selected Operating Statistics, Spring, 1977

sideration of some unscheduled delay during the run. The average recovery time includes any and all layover time for the route.

The average operating speeds of routes in the study area range from 10.5 to 12.4 m.p.h., depending on time of day. Layover time compared to total run time ranges from 28 to 32 per cent. Study area bus routes have lower speeds and higher layover time than the overall MBTA bus system. However, it is difficult to determine precisely how much worse than the average these characteristics are, because express and suburban routes are included in calculating the overall MBTA average.

Bus Ridership

Total MBTA bus system ridership declined by approximately 30 per cent between 1965 and 1974 (excluding express bus routes). About one-third of the loss occurred between 1965 and 1969 and two-thirds between 1969 and 1974. The ridership loss was greatest following the increase in fares from 10 to 20 cents during December, 1968.

As Table 3.8 indicates, the bus ridership loss varied between 8 and 45 per cent on individual lines in the study area. Table 3.8 indicates that most service cutbacks during that period were approximately proportional to rider decline. Determination of the cause-effect relationship (i.e., the extent that service cutback accelerated rather than responded to rider decline) would require further study of individual routes.

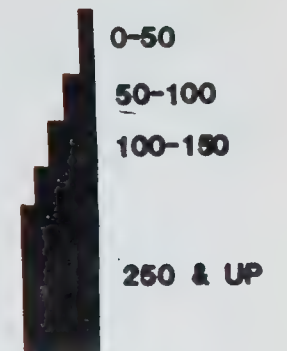
TABLE 3.8
RIDERSHIP TRENDS FOR SELECTED BUS ROUTES, 1965 - 1974

Route No.	From	To	Via	Ridership Loss	Service Cutback
1	Dudley	Harvard Sq.	Mass. Ave.	45% *	13%
15	Dudley	Kane Sq.	Uphams Corner	33	20
17	Andrew	Fields Corner	Meeting House	31	20
21	Ashmont	Forest Hills	Morton St.	21	0
22	Ashmont	Dudley	Talbot Ave.	10	8
23	Ashmont	Dudley	Washington	8	0
26	Ashmont	Norfolk	--	44	34
27	Ashmont	Mattapan	River St.	26	33
29	Egleston	Mattapan	Blue Hill Ave.	18	0
30	Mattapan	Roslindale Sq.	Cummins Hwy.	16	8
31	Mattapan	Wolcott Sq.	Cleary Sq.	29	26
32	Cleary Sq.	Arborway	Hyde Park Ave.	29	26
41	Dudley	Eliot	Centre St.	47	33
43	Egleston	Park/Tremont	Tremont	25	38
44	Dudley	Seaver	Humbolt Ave.	36	34
45	Dudley	Franklin Park	Blue Hill Ave.	31	24
50	Cleary Sq.	Arborway	Roslindale Sq.	10	23

* Roxbury only

Source: "1977 Transit Market Study-MBTA Ridership over the Past Decade"
by EOTC & CTPS, April, 1977

DAILY BUS TRIPS



Weekday Round Trips

replacement/transit improvement study

SOUTH END
DORCHESTER

ROXBURY
MATTAPAN

Massachusetts Bay Transportation Authority

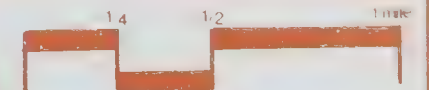


FIGURE 3.4



Daily records of bus ridership are not maintained by the MBTA. Current data on bus riders are available from seasonal ridership surveys which tabulate the number of on-board passengers at the maximum ridership point (peak load point) of that line. The location of the peak load point of an individual route is based on historical data concerning maximum route ridership locations defined by the MBTA. These seasonal tabulations are used to help determine service frequency for each route.

Table 3.9 summarizes ridership levels observed at the peak ridership load point for each route within the study area. The ridership levels displayed in the table were observed for the daily peak travel periods (7-9 A.M. and 4-6 P.M.), the maximum 30 minute peak ("crush") period and mid-day hours. Ridership levels are shown in passengers per bus and as a percentage of on-board passengers to seats. These data are utilized in Chapter 6 to evaluate the adequacy of various routes.

TABLE 3.9 1
EXISTING BUS RIDERSHIP

		Peak 30 Minutes	Observed Bus Load Levels ² (% of available bus seats)	
			Total Peak Period	Mid-Day Period
1	Harvard - Dudley	57 (124%)	57 (124%)	34 (74%)
8*	Columbia Pt. - Dudley	37 (80%)	28 (61%)	22 (48%)
9*	City Point - Copley	82 (178%)	57 (124%)	34 (75%)
10	City Point - Dudley	20 (43%)	18 (39%)	11 (24%)
13	Savin Hill - Northampton	12 (26%)	9 (20%)	7 (15%)
15	Kane Sq. - Dudley	65 (141%)	49 (107%)	37 (80%)
16	Egleston - Andrew	52 (113%)	36 (78%)	18 (39%)
16A	Forest Hills - U. Mass.	28 (61%)	22 (48%)	9 (20%)
17*	Fields Corner - Andrew	53 (115%)	48 (105%)	16 (35%)
18	Ashmont - Andrew	45 (98%)	34 (74%)	11 (24%)
19	Fields Corner - Dudley	54 (117%)	40 (87%)	No Service
21*	Ashmont - Forest Hills	62 (135%)	31 (67%)	15 (33%)
22	Ashmont - Dudley (via Talbot)	71 (154%)	58 (126%)	37 (80%)
23	Ashmont - Dudley (via Washington)	69 (150%)	55 (120%)	39 (85%)
25*	Ashmont - Gallivan Boulevard	38 (83%)	28 (61%)	13 (28%)
26*	Ashmont - Norfolk Street	47 (102%)	36 (78%)	13 (28%)
27*	Ashmont - Mattapan	32 (70%)	16 (35%)	11 (24%)
28	Arborway - Mattapan	56 (122%)	46 (100%)	No Service
29*	Egleston - Mattapan	67 (146%)	55 (119%)	33 (72%)
30*	Roslindale Sq. - Mattapan	20 (43%)	17 (37%)	12 (26%)
41	Dudley - Centre & Elliot Sts.	49 (107%)	42 (91%)	23 (50%)
42	Dudley - Egleston	49 (107%)	43 (93%)	15 (33%)
43	Egleston - Stuart Street	66 (143%)	48 (105%)	32 (70%)
44	Dudley - Seaver Street	71 (154%)	54 (117%)	30 (65%)
45	Dudley - Franklin Park	69 (150%)	48 (104%)	26 (57%)
46	Dudley - Heath & S. Huntington	46 (100%)	31 (67%)	16 (35%)
47*	Central Sq. - City Hospital	42 (91%)	33 (72%)	20 (43%)
48	Dudley - Boston State Hospital	No Data for Two Scheduled Trips		
49*	Northampton - Kneeland Street	21 (46%)	12 (26%)	5 (11%)
66	Dudley - Allston	52 (113%)	46 (100%)	32 (69%)
68*	Copley - E. Concord Street	17 (37%)	10 (22%)	10 (22%)

¹ Based on MBTA Spring, 1977 data; Routes with asterisk (*) assume 1976 MBTA ridership data

² Based on average maximum number of passengers on bus at given point;
Bus seats assumes an average 46 seats per MBTA bus

TAXI SERVICES

Major taxi companies serving the study area include Ebony, White Yellow and Mattapan Taxicab companies, in addition to numerous smaller taxi outfits associated with the Independent Taxi Operators Association (I. T. O. A.). According to I.T.O.A. information, a total of approximately 500 taxis (from all companies) are available during the day in the South End, Dorchester, Roxbury and Mattapan areas. This number compares to the more than 1,500 taxis licensed for the entire City of Boston. During evening hours, an estimated 250 to 300 taxis are available in the study area. Besides these services, many organizations in the area provide localized transportation service by auto or van.

Taxicab representatives said that the majority of requests for taxicab services within the area are for short, local trips within close proximity of the respondent's residence. A far lesser proportion of taxi requested trips are to the Boston Central Business District. Common requests for taxi services within the area are for medical trips and shopping trips (particularly for people carrying packages).

Basic fares for taxi services are 60 cents for the first four-ninths of a mile and 10 cents for each additional one-ninth of a mile. However, elderly residents (65 and over) are provided a 20 per cent discount of total fare. In addition, elderly clients of the Home Care Program are provided an extra 5 per cent discount for medical-related trips.

Based on dispatching records of the I.T.O.A., more than half of all requested calls for taxi services in Boston come from the study area though the study area's population is only 1/3 of the City's. The frequent use of taxis in the study area is particularly significant in light of the fact that income levels are the lowest in the City. Reasons for the high level of usage are low automobile ownership and the fact that public transportation cannot provide convenient service for some types of trips (e.g. shopping trips to the supermarket). In addition, the fear of crime often makes door-to-door taxi service preferable to walking to and waiting for public transit.

MBTA FARE STRUCTURE AND POLICY

The MBTA provides two concepts of fare payment on all modes operated: a basic cash fare and a pre-paid fare program which provides for several service options including limited and unlimited ride passes for commuter rail, an unlimited ride-limited mode transfer pass, and an unlimited ride-transfer "buy the system" pass option.

The basic cash fare for rapid transit, including the Green Line Central Subway is 25 cents with the following exceptions: Transit fares to downtown Boston from points on the Quincy extension of the Red Line, Malden and Oak Grove Stations on the Orange Line North, and the Riverside Branch of the Green Line (Longwood to Riverside) are 50 cents. Transit fares to downtown Boston from the Green Line's Huntington, Beacon and Commonwealth Branches outside the Central Subway are 45 cents.

Fares on all rapid transit lines in the study area are 25 cents. All rapid transit lines provide free transfer at multi-line stations within the downtown area. The Mattapan High Speed Line is treated as an integral part of the Red Line and may be ridden locally or with a change at Ashmont to downtown for 25 cents.

All MBTA bus routes in the study area charge a 25 cent fare for adults, although some suburban or express bus routes into Boston charge up to one dollar. Where the fare is paid on the bus or trolley itself, exact fare is required. Transfer between two buses and between bus and rapid transit requires a full additional fare.

Fares on all commuter rail lines are based on a zone fare system. The present fare for commuter rail stations at Forest Hills, Roslindale, Mt. Hope, and Hyde Park to Boston (zone one) is \$1.10 for a one-way trip. Proposed one-way fares for new stations located at Morton Street and Uphams Corner on the Midland Branch during construction of the Relocated Orange Line, will be 95 cents and 85 cents, respectively.

Elderly, handicapped, students going to and from classes (high school or lower), and children under twelve are eligible for "half-fare" privileges on all MBTA operating modes for all time periods. "Half-fare" on a 25 cent bus or rapid transit trip is 10 cents.

In addition to the basic fares set by the MBTA for all its operating modes, a pre-paid program for all modes except commuter rail is offered to all companies, institutions, agencies and organizations with a minimum of five subscribers. The program provides unlimited riding for a month for the plan option selected. Under the existing system, the pass holder is paying the equivalent of eighteen round trips a month.

Commuter rail users are offered both limited ride (10 trip) passes and unlimited monthly passes which are offered to individual users. The unlimited commuter rail monthly pass includes a 25 cent rapid transit pass that allows for free transfer from commuter rail to rapid transit lines.

The process of determining and approving fares is primarily reserved for the MBTA Advisory Board and MBTA Board of Directors. The Board has convened a panel which is currently examining fares and is expected to produce recommendations for changes in Fall, 1978. The Program for Mass Transportation (PMT) has stated a fare policy, for the short term, of attempting to hold fares down until significant service improvements can be achieved. For the long term, the MBTA considers a fare system based on distance and quality of service as the most equitable, particularly when additional rapid transit extensions are completed. However, this form of fare structure would be the most difficult to implement and would require more sophisticated forms of fare collection equipment than is now incorporated within the system. The acquisition of equipment to implement a sophisticated fare policy is not now a part of the MBTA's capital program.

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4

Travel Forecasts

CHAPTER 4 TRAVEL FORECASTS

INTRODUCTION

A major element of the Replacement/Transit Improvement Study involved a forecast of the number of public transit riders for various specific transit alternatives, which was an important factor in determining the relative cost-effectiveness of each alternative. This Chapter summarizes the procedures and underlying assumptions that were used in making the ridership estimations. A more detailed description of the procedures and results is contained in Appendix C. A separate technical report on the process will be published by the Central Transportation Planning Staff in early 1978.

THE RIDERSHIP MODEL

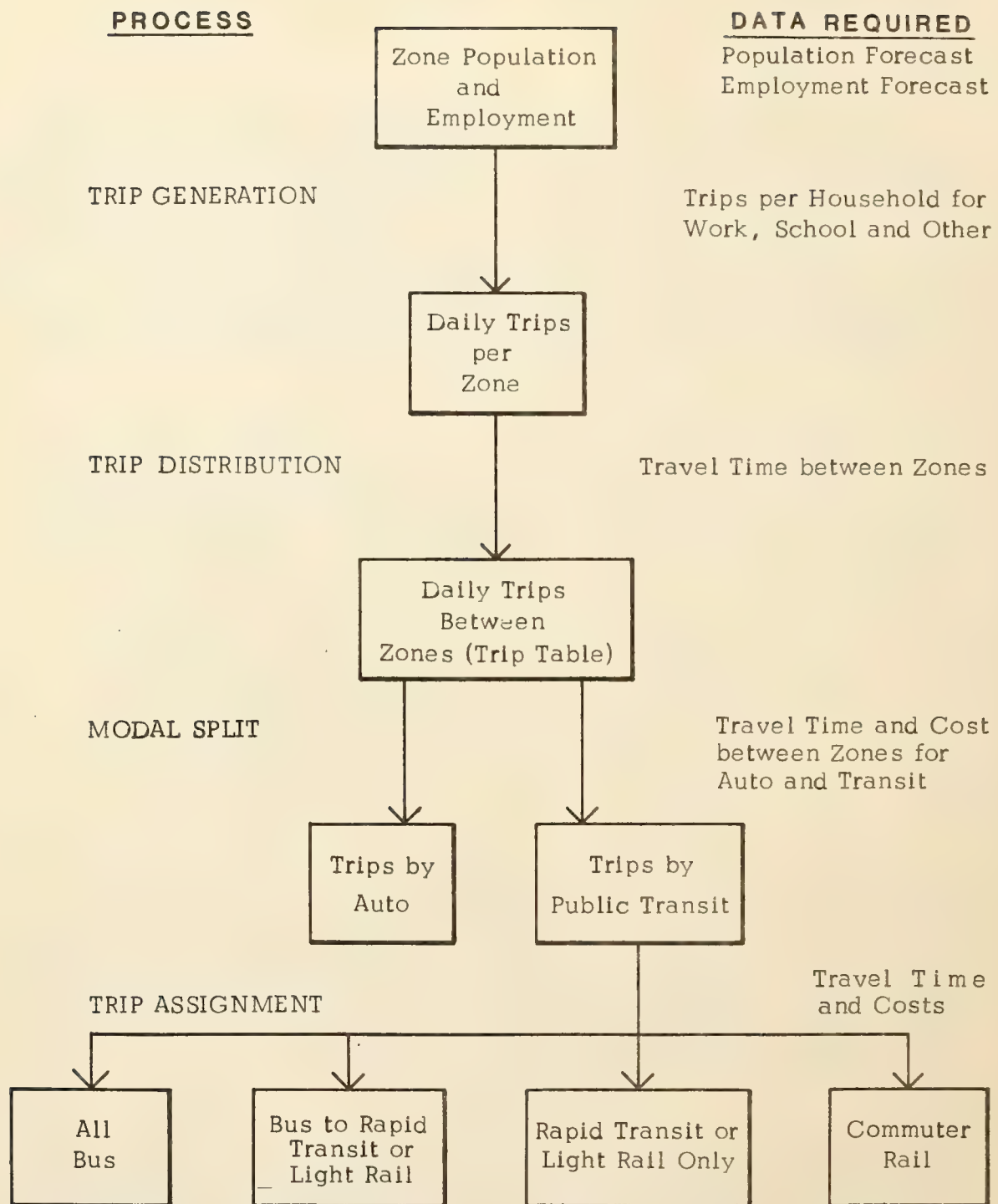
Ridership estimation is carried out using computer programs contained in the Urban Transportation Planning System (UTPS) package sponsored by the U.S. Department of Transportation. Four major sequential steps are included, as shown in Figure 4.1.

1. Trip generation (the number of trips made per person on an average weekday)
2. Trip distribution (the origin and destination of trips)
3. Modal split (whether the trip is made by private or public transportation)
4. Trip assignment (selection of specific transit modes and routes)

To make the data required for this analysis more manageable, the Boston region is divided into a large number of traffic analysis zones. Approximately 75 of these zones are located in the study area (Figure 4.2). Travel data are aggregated for a zone that consists of many households rather than for an individual person or household. Population and employment estimates are tabulated for each zone in order to estimate the number of trips expected to be made to and from each zone.

Trip Generation

The trip generation process requires estimation of the number of trips on an average weekday which originate and terminate in each zone. Trips made by the residents in a zone are estimated by using an established set of trip-generation factors based on data obtained in home-interview surveys. Trips per household are then multiplied by the number of households per



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RIDERSHIP MODEL

FLOW CHART

FIGURE 4.1

STUDY AREA ZONES

— ZONE BOUNDARY
DISTRICT BOUNDARY



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FIGURE 4.2

zone to get total zonal trips. The trip rate (the number of trips per person or household) differs depending on socio-economic characteristics, level of transportation service, and trip purpose (e.g., work trips, school trips, etc.) Added to trips generated by zone residents are trips attracted to any employers, schools or shopping areas located in the zone.

The end product of the trip generation process is the number of trips to and from a zone made by the residents for each zone and the number of trips to be attracted by work places, school, etc. for each zone.

Trip Distribution

Once the number of trips to and from a zone is estimated, the origin or destination of these trips is forecast by the use of a gravity model.

Taking the work trip as an example, the gravity model assumes that the trip maker's destination is more likely to be where job opportunities are high. In addition, the model assumes that the trip maker will try to minimize his travel time. Therefore, zones near the trip maker's residence or most accessible by transportation are more likely to be destination zones. Mathematically, the number of trips to a certain zone is directly proportional to the attractiveness of the zone and inversely proportional to the travel time to that zone. This is the basic assumption behind the trip distribution part of the model.

The end product of the trip distribution step is the number of daily trips between every possible pair of zones. The trip movements are estimated separately for different trip purposes. The matrix resulting from this process is called a trip table.

Modal Split

After the number of trips between zones is estimated, the model then estimates the proportion of these trips that are made by public transit (a procedure called "modal split"). The model estimates the percent of travel by public transportation based on the difference in travel time and cost between zones by automobile as opposed to transit. Travel time is converted to a dollar value and added to an out-of-pocket cost. Then a mode split curve which represents percent transit use versus the combined relative cost is used to determine the proportion of transit trips in each pair of zones. Different mode split curves have been developed for different auto ownership levels and for different trip lengths and trip purposes.

Time costs include in-vehicle time and out-of vehicle time. In-vehicle time is the time actually spent in either auto or transit vehicle. For transit

modes, out-of-vehicle time includes access time (that required to get to the station), wait time (time at the station waiting for the bus or train), and any transfer times. Out-of-vehicle time for auto modes includes only access time. Since out-of-vehicle time is usually perceived as being less attractive than time spent in the vehicle, it is weighted by a factor of 2.5 before being added to in-vehicle time in the calculation of total trip time.

For the auto mode, out-of-pocket costs include operating costs (gasoline, oil, maintenance, tires, etc.) and parking costs. For the transit mode, out-of-pocket costs include fare and auto-related costs associated with driving to a transit stop if an automobile is used.

The end product of this step is the number of public transit trips between every pair of zones for each of four trip purposes (home-based work, school and "other", and non-home based).

Trip Assignment

The final step in ridership estimation is a forecast of the specific transit service that persons assigned to transit will use among available services such as bus only, bus to rapid transit, or rapid transit only.

The basic assumption in the model is that a trip maker will choose a transit service or combination of services which provide the shortest travel time. The shortest travel-time transit service between every pair of zones is calculated and all trips between those zones are assigned to that service transit. The final result is the total number of trips on an average weekday on each transit service, whether bus, light rail, rapid transit or commuter rail.

POPULATION FORECASTS

Recently the Central Transportation Planning Staff made population and employment forecasts between 1975 and the year 2000 in increments of five years for the entire Eastern Massachusetts (EMRPP) region.

Population for the 1975 base year was estimated by establishing a control total for each Eastern Massachusetts municipality based on the 1975 State Census and by allocating the municipal total to each CTPS zone based on the 1970 U. S. Census population distribution.

The initial 1975 population estimate made by the CTPS for the study area was modified in parts of the South End and Roxbury where major changes in population distributional patterns have occurred due to building construction and/or abandonment.

The CTPS estimated future population throughout the EMRPP based on an extrapolation of past trends with modification by area planners where indicated. This analysis indicated that population in Boston would decline by about three percent between 1975 to 2000. The Boston Redevelopment Authority (BRA), who reviewed the figures, believed it likely the Boston population would increase during that time period. Because limited time and resources were available in Phase I to resolve this issue, it was decided at a Coordination Meeting that 1975 population estimates, rather than future estimates, should be used in rider forecasts during Phase I. CTPS and the BRA will jointly develop future forecasts for Phase II. It should be noted that the difference between 1975 population and CTPS forecasts of future population is small and would have had minimal effect on Phase I rider estimates.

EMPLOYMENT FORECASTS

The distribution of 1975 employment by zone was estimated by CTPS by updating 1963 EMRPP inventory data. The update considered the amount of developable commercial and industrial land available in 1963, the proximity of similar uses, and the addition or deletion of major employers in the area. The results were checked against Department of Employment Security data and adjusted where required. Employment growth in future years was determined by analyzing the amount of open space available to absorb new firms, the current location of employment centers, and trends for mix of manufacturing and non-manufacturing industry employment.

Based upon research conducted as part of the R/TIS, additional jobs expected to be produced by planned development were added to the initial CTPS forecasts for the year 2000:

1. Southwest Corridor Project (2,500 jobs)
2. Crosstown Industrial Park (1,600 jobs)
3. Allston-Mapes Industrial Park (500 jobs)

The study area is estimated to contain 53,100 jobs in 1975. Of these, some 13,500 jobs were in manufacturing. Forecasts indicate that the total employment in the study area will increase, while the manufacturing sector will decline. The location of major employers and major housing concentrations is given in Figure 4.3.

Table 4.1 shows the population and employment estimates used for rider estimates in Phase I. They are subject to revision in Phase II.

TABLE 4.1
POPULATION & EMPLOYMENT FORECASTS

Community	Population (thousands)		Total Employment (thousands)		Manufacturing Employment (thousands)	
	1975	1985	1975	1985	1975	1985
Eastern Massachusetts Region	3,813	4,099	1,595	1,853	3,802	369
Boston	636	626	484	568	54	51
Study Area	215	215	53.1	63.3	13.5	13.1
South End	21.2	21.2	13.1	15.5	2.2	2.0
Roxbury	64.9	64.9	21.1	28.0	7.0	7.0
North Dorchester*	45.4	45.4	8.5	8.1	2.0	1.8
South Dorchester*	42.4	42.4	4.1	4.7	0.2	0.2
Mattapan	27.8	27.8	2.7	3.1	0.4	0.4
Jamaica Plain*	13.5	13.5	3.6	3.9	1.7	1.7

*Includes only section within study area

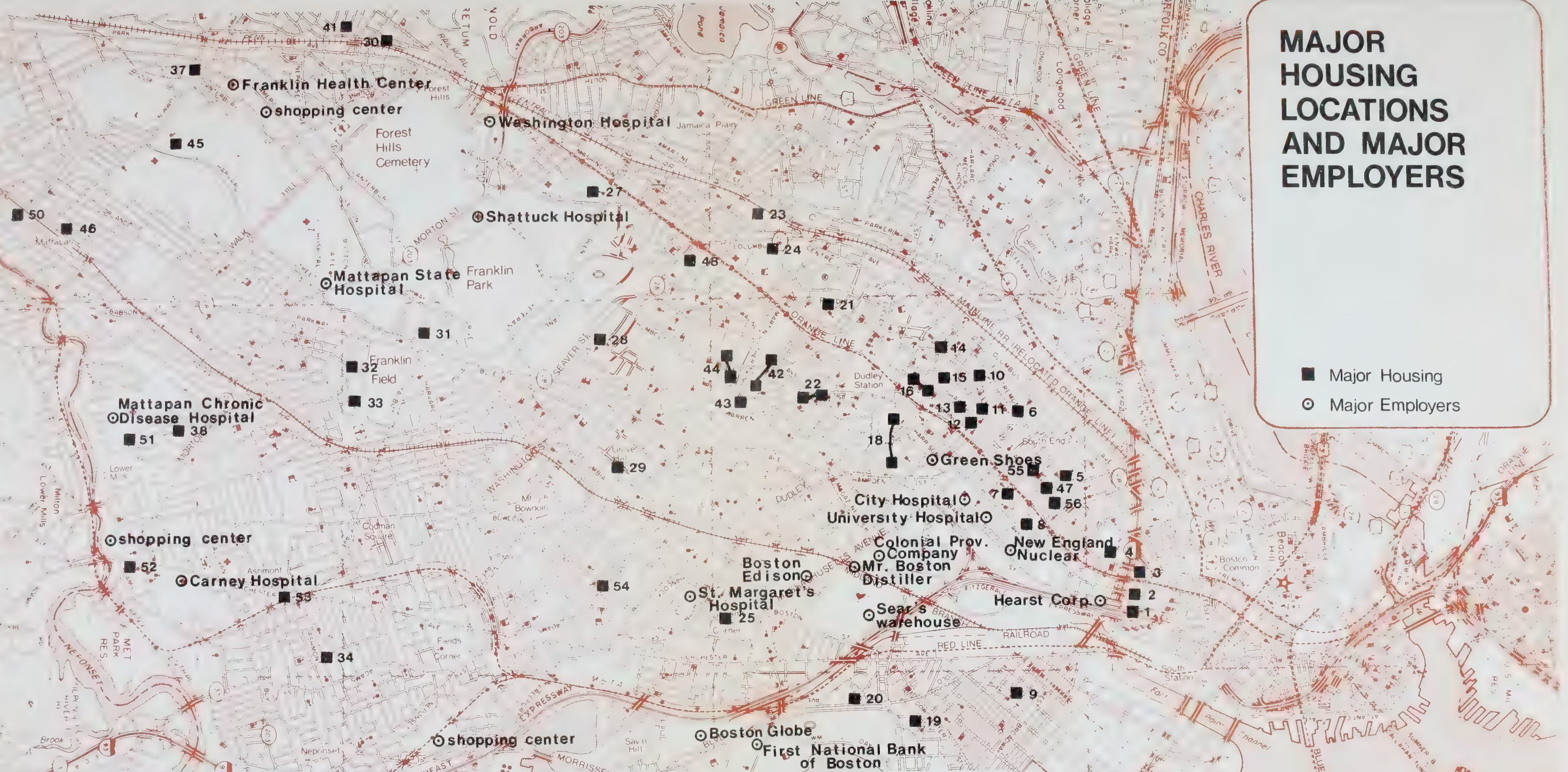
TRIP GENERATION

On an average weekday in 1975, about 8,000,000 trips are estimated to have been made within the entire EMRPP region which includes most of Massachusetts east of Worcester and north of Taunton. About half of these trips are made inside Route 128. Some 450,000 trips, 5.6 percent of the regional total of 8,000,000 were estimated to have been either produced or attracted in the study area in 1975. The 215,000 residents of the study area are estimated to have produced 291,800 trips. The area is estimated to have attracted 242,500 trips.

Table 4.2 shows the purpose of trips produced and attracted by the study area.

MAJOR HOUSING LOCATIONS AND MAJOR EMPLOYERS

- Major Housing
- Major Employers



MAP NO.	HOUSING NAME	NO. UNITS
1	Tai-Tung Village	224
2	Parcel R-4	162
3	Mass Pike Towers	198
4	Castle Square	602
5	Methunion Manor	150
6	Piano Craft Guild	174
7	Franklin Square	196
8	Cathedral Housing	508
9	D Street	972
10	Roxse Housing	364
11	Cramfield Gardens	135
12	Lenox/Camden	378
13	Westminster & Willard Place	279
14	Whittier Street	200
15	LRCC Townhouses	
16	Haynes House	131
17	Smith House	132
18	Orchard Park	774
19	Old Colony	873
20	Old Harbor Village	1016
21	Saint Joseph's	140
22	Warren Gardens	228
23	Amory Street	234
24	Academy Homes	515
25	Annapolis	56
26	Columbia Point	1504
27	Forest Hills Apt.	108
28	Elm Hill	86
29	Freedom House	
30	Archdale	
31	Franklin Hill Ave.	375
32	Franklin Field	504
33	Ames Street	160
34	Ashmont	54
35	Wash. & Beach Sts.	274
36	High Point Village	540
37	Cummins Tower	340
38	Morton Street	251
39	Georgetown Apts	958
40	Fairmont	202
41	Florence Apts	138
42	Charlame Park	130
43	Warren Street	104
44	Marksdale Gardens	177
45	Livermore Street	
46	Fairlawn Estates	
47	Vivendas "La Victoria"	181
48	Walnut Park	168
49	Riverside	40
50	D Hassan	100
51	Groveland	64
52	Lower Mills	183
53	Codman	108
54	Quincy/Bowdoin	96
55	West Newton	136
56	West Dedham	204

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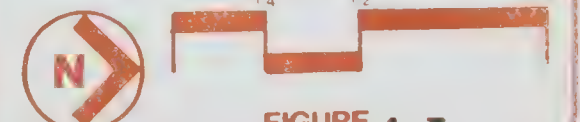


FIGURE 4.3

TABLE 4.2
STUDY AREA TRIPS BY PURPOSE

Trip Purpose	1975 Daily Person Trips	
	<u>Trip Productions</u>	<u>Trip Attractions</u>
Home-Based Work	110,570 (38%)	64,040 (26%)
Home-Based School	25,340 (9%)	18,850 (8%)
Home-Based Other	108,180 (37%)	104,740 (43%)
Non-Home-Based	<u>47,710 (16%)</u>	<u>54,870 (23%)</u>
Total	291,800 (100%)	242,500 (100%)

TRIP DISTRIBUTION

Forecasts of the origin and destination of trip makers in the form of a trip table provided essential data during the course of the study. In the beginning of Phase I, this information helped develop transit alternatives suited to the travel desires in the study area. The data later became an essential input to the ridership model for evaluation of selected alternatives.

Recently a 1975 table was developed for use in the Boston Metropolitan region by Alan M. Voorhees and Associates (AMV) under contract to the Massachusetts Department of Public Works (MDPW). This trip table was modified to reflect the revised population estimate previously described. This revised trip table was used for the identification of existing (1975) travel patterns and was the basis for the future (1985) trip table.

It was recognized early in the study that this trip table, which updates 1963 home interview information on the basis of current employment and population distribution, could not completely reflect the changes that have taken place in the study area since 1963. Consequently, the study team conducted a survey at all Orange Line and selected Red Line stations during three days in June of 1977. The purpose of the survey was to provide data for Phase II of the study. Procedures and results from the survey are described in detail in Appendix D. The numbers described in this section are based on the travel patterns derived from the 1975 AMV trip table for the study area.

Approximately 71 percent of all study area trips were trips between the study area and the zones outside the area but within Route 128, 11 percent represented trips between the study area and the area outside Route 128, and the remaining 18 percent of the trips were made completely within the study area.

Figure 4.4 shows a more detailed trip interchange pattern between the study area and surrounding districts within Route 128. The predominant movements were to and from the Boston CBD (13%), Back Bay (5%), Fenway Park and hospital complex (7%), South Boston (4%) and Cambridge (4%). They represent slightly over one half of the total trips when the intra-area trips are included.

Figure 4.5 shows trip movement between neighborhoods within the study area. The figure indicates that the predominant movements were short local trips and that those trips were spread fairly evenly throughout the study area.

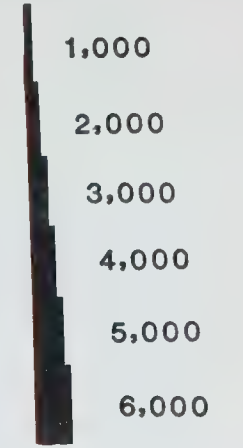
MODAL SPLIT AND TRIP ASSIGNMENT

Both modal split and trip assignment parts of the model are necessarily a function of the transit system selected for inclusion in each model run. The results of these analyses will be discussed further when the alternative transit systems are discussed in Chapter 9.

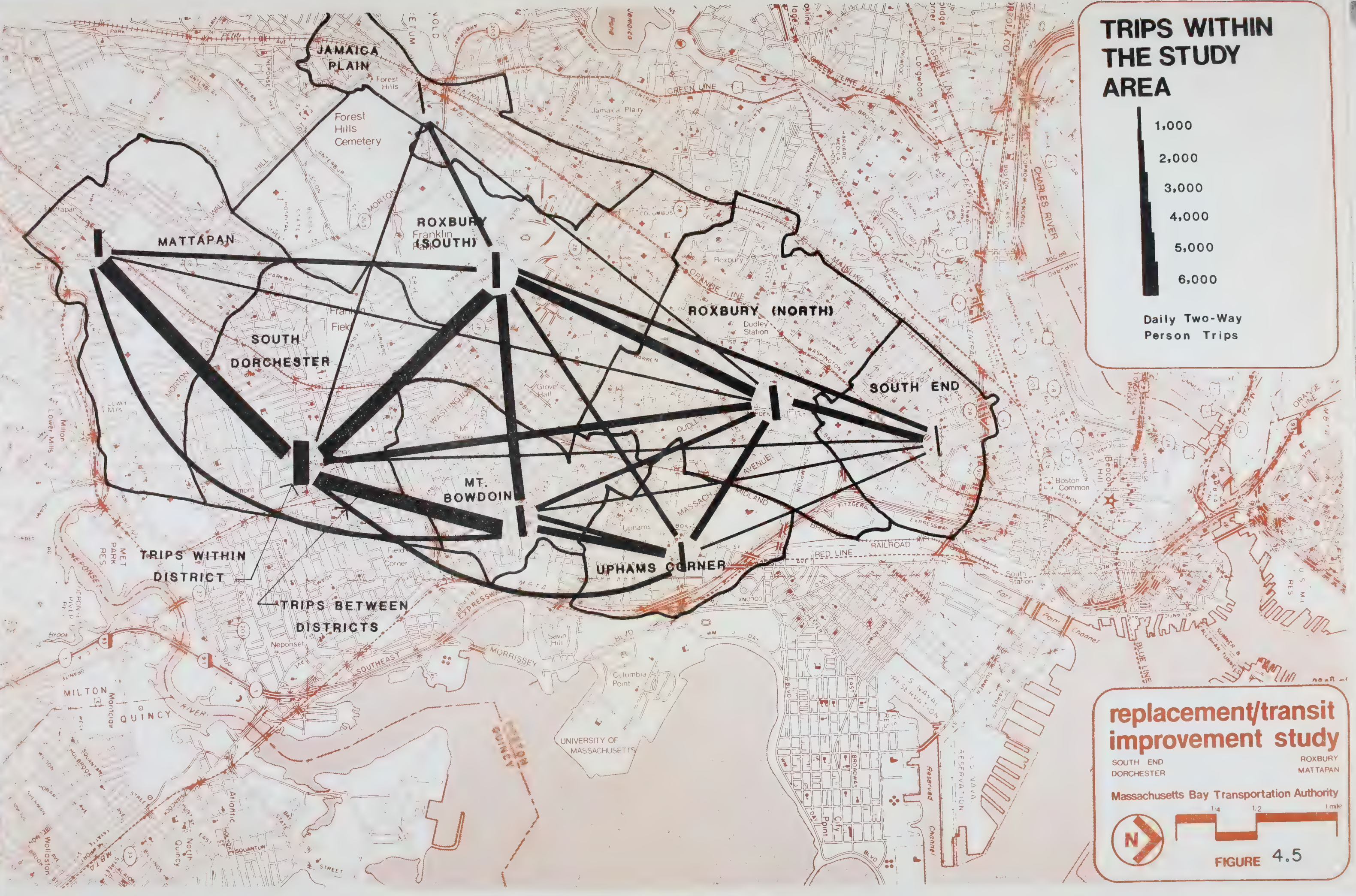


FIGURE 4.4
DAILY TRIPS TO AND FROM STUDY AREA

TRIPS WITHIN THE STUDY AREA



Daily Two-Way Person Trips



TRIPS WITHIN DISTRICT

TRIPS BETWEEN DISTRICTS

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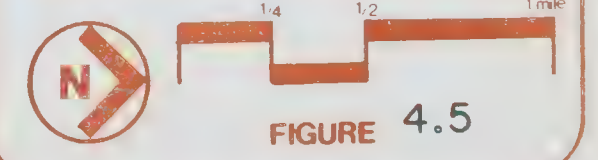


FIGURE 4.5

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5

Community Participation

CHAPTER 5 COMMUNITY PARTICIPATION

INTRODUCTION

The Replacement/Transit Improvement Study poses a unique challenge to the community liaison team for a variety of reasons:

- a) The study involves communicating the complex technical process of selecting a transportation system from a large number of potential vehicle types and alignments.
- b) The study deals with improvements that would require an additional three to five years of further planning and engineering prior to implementation.
- c) The study area has a population of over 200,000, with a wide variety of ethnic, linguistic and educational backgrounds (see Chapter 2).
- d) Some of the area's residents (primarily in the South End, Roxbury and Jamaica Plain) were very closely attuned to transit studies and community participation as a result of the BTPR and Southwest Corridor. Many others in the remainder of the study area had little previous involvement with such studies.
- e) In addition to local citizens, the community liaison team had to deal with numerous business groups, local agency and institutional personnel, and city and state officials.
- f) Many study area residents have to live with pressing day-to-day problems such as crime, school busing, discrimination, unemployment, drugs, and others which naturally weigh more heavily on their minds than public transportation.
- g) The community in large part was "turned off". People were unaware of the study or any action they could take to get a better public transportation system.
- h) Many residents have a poor perception of their current transit system and believe that they do not have impact to effect changes in the system.

PROCESS

To meet these challenges, the community liaison staff formulated a program based on a three-step process:

- 1. awareness
- 2. understanding
- 3. commitment

Awareness

Community residents were made aware of the study and how it fit in with the program of transportation improvements in the Southwest Corridor. This step continued throughout Phase I as more and more people were brought into the study.

The process of increasing awareness wasn't restricted to community groups. A number of state and city agencies did not know of the study and were also reached as part of the awareness process.

Understanding

Once they became aware of the study, it was important that the community understand:

- How the study interacted with other Southwest Corridor projects
- How transportation projects are implemented
- What the study and the project could accomplish and, equally important, what it could not accomplish
- What transportation improvements were available, what their characteristics were, and what impact they were likely to have on the daily lives of residents

For these reasons, a major educational program became an important component of the community liaison effort.

Commitment

Commitment on both sides was recognized as essential to success of the project. The community had to be convinced that there was a serious commitment on the part of the agencies to implement transportation improvements in the study area. Likewise, it was important for the community to understand that their own commitment was essential to implementation of a workable project. The latter task was particularly difficult because of the long lead time required for project implementation and the consequent lengthy commitment required by the community.

METHODS OF COMMUNICATION

Site Office and Staff

A site office was established early in the study and maintained throughout Phase I. The office was located near Dudley Station, the hub of existing public transportation in the study area. Study area residents staffed the site office. These people, working with other members of the MBTA and consultant project team, set up community meetings and contacted residents, businesses and agencies.

Community Meetings

Meetings provided an opportunity for groups with similar and dissimilar needs to hear proposals from consultants and to make their own feelings heard. Area-wide "Project Working Committee" (PWC) monthly meetings (all area people were welcome) and regular 8:30 A.M. Friday weekly meetings at the site office (again, everyone welcome) provided continuity during Phase I.

The PWC meetings were held in various neighborhoods in order to attract new people to each meeting. In addition, most neighborhood groups and other organizations had an opportunity to have the community liaison team give a presentation/question-answer session in their neighborhood. Many times these were part of the regular agenda of the organization. Meetings are discussed in more detail in the next section.

Mailings

A mailing list was developed for the project from existing lists of neighborhood groups and agencies. The list was expanded and amended significantly during the course of the study from meeting sign-in lists and phone inquiries. Before each Project Working Committee meeting, a mailing was sent including a notice and agenda for the meeting, minutes of the previous meeting and other information that would assist people in understanding the current status of the project. Letters were also sent to leaders confirming times and dates of local meetings.

Posters and Flyers

Meeting announcements were distributed in various ways for different meetings. In addition to mailings, notices for local meetings were slid under apartment doors, left in lobby and laundry areas, posted in prominent locations (including transit stations) and handed to individuals.

Display Exhibits

Approximately 20 display exhibits were constructed to help make people aware of and understand the study. These exhibits became an "Information Center" with updated information about the project including a notice of upcoming Project Working Committee meetings. Some of the units were moved from time to time to cover the entire study area.

Transit Design Kit

A two-color brochure (Figure 5.1) was prepared for wide distribution to inform and educate people about the study. The brochure included answers to important questions about the study and emphasized the

importance of community involvement. It also contained a primer on various transportation modes and jargon used during the study. It was sent to all persons on the mailing list, dropped off at meetings, put in Display Exhibits and distributed generally by local liaison personnel.

Bi-Lingual Involvement

Several meetings were held with organizations that required Spanish speaking presentations. These were accomplished with the assistance of the MBTA project manager who is Spanish speaking and a local consultant employee who is also bi-lingual. One presentation on video tape was made entirely in Spanish and broadcast through closed circuit TV to an entire apartment complex. Also, most printed handouts for general areawide use were printed in both Spanish and English.

Press Releases

The liaison team sent meeting notices to all local and city-wide newspapers, radio and television stations. Working closely with the MBTA Public Affairs Department, press releases were developed for several meetings to assist editors in providing accurate coverage of the study. These notices and releases were followed up with phone calls and requests that reporters attend Project Working Committee meetings.

Video Tape

Midway through the project a video tape summary presentation about the project was begun by the liaison team with the assistance of individuals working with the Harriet Tubman House, Boston Media Council, and other community agencies. While the tape was not completed during Phase I, the exercise of stating the problem concisely for this medium was of assistance in making other presentations.

System Riding and Photos

The liaison staff spent time on study area buses and rapid transit lines to familiarize themselves with the system and to interview users, thereby getting an immediate subjective understanding of transportation in the area.

Suggestion Sheets

Suggestion sheets (Figure 5.2) were prepared and distributed to provide an opportunity for area residents to record how they felt current MBTA service could be improved. An added bonus for the liaison team was getting a new name for the mailing list and an occasional new group for a presentation. These sheets were printed in Spanish and English with postage prepaid.

How does this study differ from other studies on transportation improvement projects in the area?

How does it differ from Orange Line Relocation?

The Orange Line study dealt with the relocation of the elevated from Washington St. to the railroad near Columbus Ave. and construction of an Arterial St. parallel to the railroad from Ruggles St. to Jackson Sq. Preliminary design of the relocated Orange Line and Arterial St. has begun. The Replacement/Transit Improvement Study deals with public transportation after the Orange Line is relocated and the elevated is removed.

How does it differ from Crosstown Street Project?

Design of a Crosstown St. (connecting to the Arterial St.) from Mass. Ave. near City Hospital to Ruggles St. and Columbus Ave. has begun and construction is planned for 1978. This street occupies some of the land initially cleared for the Innerbelt. The Crosstown St. will provide access to the Southeast Expressway for vehicles presently crowding neighborhood streets in the South End/Lower Roxbury. Land has been reserved adjacent to the street for public transportation in the event that results of the Replacement/Transit Improvement Study show that such an alignment is feasible.

How does it differ from Circumferential Study?

The Circumferential Study will evaluate the need and feasibility of crosstown service from Medford to Central Square, the Fenway, City Hospital, and So. Boston. The possible Circumferential Service may also allow easy transfer between the various lines without the need of making connections in the downtown area. The Circumferential Study will be coordinated with this study.

What is the Midland Railroad Upgrading?

Construction of the Orange Line relocation is expected to begin in January 1979. Trains using the Penn Central alignment will be temporarily relocated to the Midland Branch. Work has already been started so that it can be completed by January 1979. The Midland Branch deteriorated during the last 30 years; upgrading is needed to meet newer service requirements. Non-stop train service to South Station will use the upgraded Midland Branch from 1979 to 1983 when the Orange Line relocation is completed and train service is restored to the present alignment.

TRANSPORTATION WORDS

MBTA Mass. Bay Transportation Authority
DOT U.S. Department of Transportation
CTPS Central Transportation Planning Staff (Boston area)

LRV Light Rail Vehicle (The new Boston trolley)
PCC The standard Boston trolley
BTPR Boston Transportation Planning Review (A study in the early 1970's)

Mass Transit
Service provided for transporting large numbers of passengers on established routes and fixed time schedules within cities and metropolitan area

Midland Branch
The two-track railroad running through Dorchester from Readville to South Station

Use Benefits
Benefits to users of transportation systems in terms of improved service, faster travel time, comfort, etc.

Right-of-Way
The land used or required for transportation

Median
Part of the street reserved exclusively for public transit, typically in the center of the street

Si Usted no puede leer esto en Ingles, tambien lo tenemos en ESPANOL. Por favor llame - 427-7060 o venga al 90 de la Calle Warren en Roxbury. This information is available in Spanish.

NOW THAT YOU HAVE READ THIS, YOU ARE ON YOUR WAY TO BECOMING AN EXPERT ON PLANNING PUBLIC TRANSPORTATION FOR THIS AREA.....DON'T WAIT FOR FURTHER INFORMATION. CALL 427-7060 OR VISIT 90 WARREN STREET AND INSTRUCT US!

Bulk Mail
Permit No.
5
Boston, Ma.

replacement/transit
improvement study

SOUTH END
DORCHESTER
ROXBURY
MATTAPAN

90 WARREN STREET, ROXBURY, MA 02119



HOW TO REDESIGN YOUR TRANSIT SYSTEM!~

see inside



HOW CAN I REDESIGN MY TRANSIT SYSTEM?

YOU CAN HELP REDESIGN THE TRANSIT SYSTEM IN THIS AREA BY PARTICIPATING IN THE REPLACEMENT/TRANSIT IMPROVEMENT STUDY.... SEE INSIDE FOR OTHER EXCITING QUESTIONS AND ANSWERS. ☐ ☐ ☐ ☐

replacement/transit
improvement study

SOUTH END
DORCHESTER

ROXBURY
MATTAPAN

Massachusetts Bay Transportation Authority
COMMUNITY PROJECT
INFORMATION FLYER

FIGURE 5.1

questions & answers

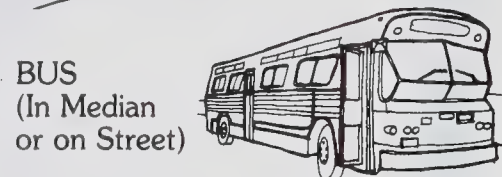
What is the Replacement/ Transit Improvement Study?

Analysis of transportation needs to develop a new plan

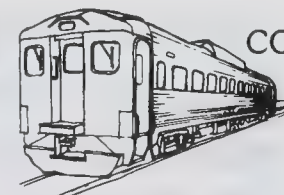
This study is an analysis of current and future public transportation needs in the South End, Roxbury, Dorchester, Mattapan areas. The objective is to develop an overall transportation strategy for the area and to decide on specific services upon removal of the Washington St. elevated.



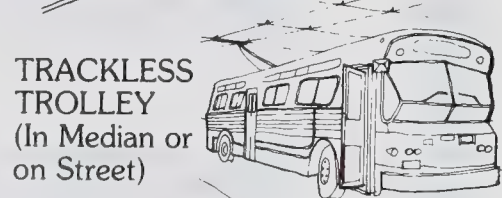
RAPID TRANSIT/ SUBWAY CAR
(In Tunnel or on Railroad Line)



BUS
(In Median or on Street)



COMMUTER RAIL
(On Railroad Line)



TRACKLESS TROLLEY
(In Median or on Street)



STREETCAR/LIGHT RAIL VEHICLE (LRV)
(In Tunnel in Median or on Street)

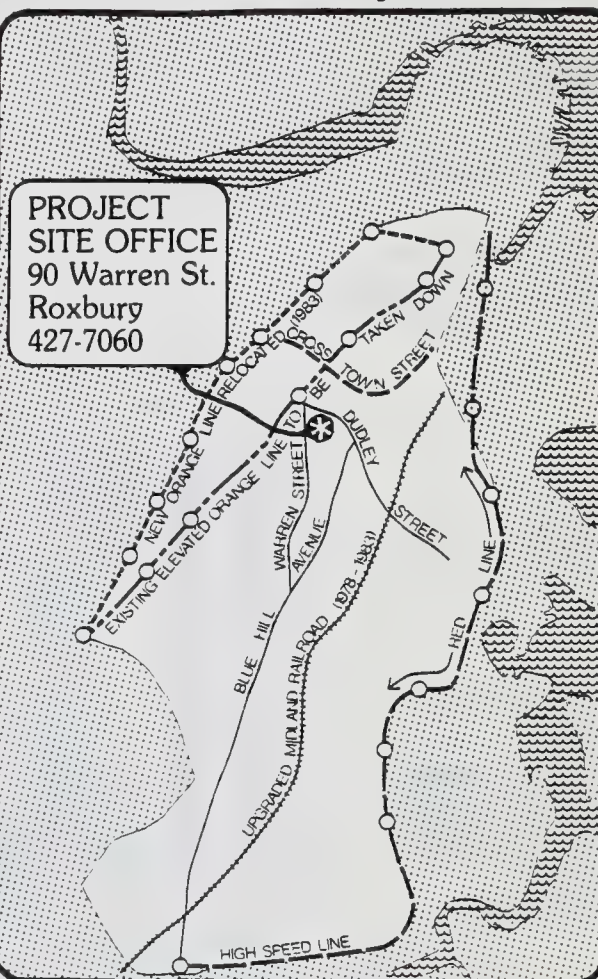
possible people carriers

Why is this study being done?

This study will prepare the necessary information for the implementation of any new or improved transit services in the study area. In 1972, after the Boston Transportation Planning Review (BTPR), construction of the proposed Southwest Expressway was cancelled, and the Governor concluded in concert with residents of these neighborhoods that the Washington Street Elevated Orange Line should be relocated into the corridor cleared for the expressway.

At that time, it was recognized that some form of replacement service, with the possible extension of that service to Dorchester and Mattapan was an important part of a transportation plan for the Southwest area. A related opportunity presented by this study is a discussion of improvements to the existing bus service by working with the MBTA Operations and Community Affairs Departments.

Where is the study area?



What is the schedule?

Phase 1
Complete
Nov. '77

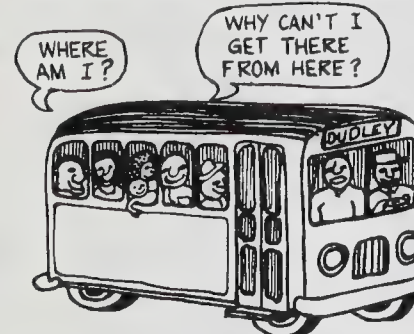
Analysis of transportation needs in order to select three to five possible transportation alternatives for further study.

Phase 2
Complete
July '78

Detailed analyses of the alternatives selected in Phase 1. A proposed Draft Environmental Impact Statement and Alternatives Analysis Report will be submitted to the Federal Government.

Phases 3/4
Complete
Summer '79

- incorporating the comments of the Federal Government and neighborhood agencies.
 - holding a public hearing on the preferred alternatives selected in the Phase II report,
 - preparing of any capital grant applications being submitted for consideration at the public hearing.
- Preparing the Final Environmental Impact Statement reflecting all comments received during the public hearings.



Who is doing the study?

MBTA and consultants with community

The study is being managed by the MBTA's Southwest Corridor Development office. The two principal consultant firms for the study are: Tippetts-Abbett-McCarthy-Stratton (TAMS) and Childs Bertman Tseckares Associates, Inc. (CBT). The State's Central Transportation Planning Staff (CTPS) is providing assistance in developing forecasts of future transit ridership. Also on the consultant team are economists, urban planners and a local development group (Greater Roxbury Development Corp.).

Why should I get involved in this study?

Results will affect jobs and your transportation

This study offers you the opportunity to participate in determining your neighborhood's future, since the results of the study will affect the public transportation system, land development and jobs in the area.

Community interests will play a large part in determining the final plan. The final plan must be acceptable to community interests as well as the agencies involved in implementing it.

The study may not respond to your specific needs unless you make yourself heard through attendance at public meetings on the project.

How can I get involved?

Individuals or groups wishing to become more involved in overseeing the work on a monthly basis are invited to join the Project Working Committee. In addition, you can phone 427-7060 to be put on a mailing list. For up-to-date information on what's happening, come to the regularly scheduled Friday morning meetings at 8:30 to 10:00 a.m. held at 90 Warren Street. You may also call to have a presentation to your group or neighborhood.



How will study decisions be arrived at?

The community will participate in the selection of 3 to 5 alternatives.

The consultant will present information and make preliminary recommendations on transportation alternatives throughout the study. These will be initially evaluated at neighborhood meetings. You as an interested resident can become a member of the Project Working Committee, which will recommend acceptance or changes to be acted upon by the MBTA's Project Manager. This process will continue to the end of Phase I in 1977, when 3 to 5 alternatives will have been selected for further study in Phase II.

SEE OVER FOR MORE ANSWERS ☐ ☐ ☐ ☐ ☐

Business Reply Mail
No Postage Stamps Necessary if Mailed
in the United States

First Class
Permit No.
47489
Boston, Ma.

Postage will be paid by


Massachusetts Bay Transportation Authority
Community Affairs and Marketing
50 High Street
Boston, Massachusetts 02110

(EN ESPAÑOL DE VUELTA LA HOJA)

suggestions

Your help is needed to improve public transportation in this area. The Orange Line is to be relocated to the route of the railroad tracks along Columbus Avenue and improved. Therefore, this study has been initiated to decide future public transportation options for the area. As part of the study, it is important to know how you use the existing bus/rapid transit system and what suggestions you have for a better system.

- Where do you live in the area? Where do you work in the area?

Street name area/neighborhood Street name area/neighborhood
- Do you use the public bus/transit service now? Yes ☐ No ☐
A. If yes, how often? _____
B. If not, why? _____
- When you use bus/rapid transit, what routes do you use? _____
A. Why do you normally use these routes?
Work ☐ Shopping ☐ School ☐ Medical ☐ Other ☐ _____
- Do the existing bus/rapid transit services satisfy your travel needs?
Yes ☐ No ☐ If not, why? _____
- What changes in the  service would you like? _____
- How often do you have the use of an automobile?
Every day ☐ Never ☐ Weekends only ☐ Other ☐ _____

If you would like to receive additional mailings, attend future meetings or have us make a presentation to your group, please put your name, address, phone number and group name below:

NAME PHONE GROUP NAME

ADDRESS CALL - 427-7060



replacement/transit improvement study
SOUTH END ROXBURY DORCHESTER MATTAPAN

Tippetts Abnett McCarthy Stratton Childs Bertman Tseckares Assoc Inc


90 WARREN STREET ROXBURY, MASSACHUSETTS


CALL - 427-7060



replacement/transit improvement study
SOUTH END ROXBURY DORCHESTER MATTAPAN

Tippetts Abnett McCarthy Stratton Childs Bertman Tseckares Assoc Inc

PLEASE MAKE A NOTE OF YOUR IDEAS ON THE OTHER SIDE OF THIS SHEET...THEN FOLD, TAPE OR STAPLE, STAMP AND MAIL TO THE ADDRESS ON THE BACK OF THIS SHEET 


LE AGRADECERÍAMOS QUE INDIQUE SUS IDEAS EN EL FORMULARIO...Y LUEGO CERRARLO, ASEGURARLO, SELLARLO Y MANDARLO POR CORREO A LA DIRECCIÓN INDICADA EN EL REVERSO 

ENGLISH (SEE OVER)

sugerencias

Necesitamos su ayuda para mejorar el transporte público en esta zona. El elevado de la Orange Line va a ser relocalizado a las vías paralelas a la Columbus Ave. Es por eso que se ha iniciado un estudio para elegir otras alternativas de transporte público para la zona. Como parte de este estudio, nos es importante saber como usa el público los autobuses y trenes hoy en día y recibir sugerencias para mejorar el sistema en el futuro.

- ¿Dónde vive? ¿Dónde trabaja?

Calle Barrio Calle Barrio
- ¿Usa transporte público? Sí ☐ No ☐
A. ¿Si lo usa, con qué frecuencia? _____
B. ¿Si no lo usa, por qué no? _____
- ¿Que rutas de autobús/tren usa cuando viaja? _____
A. ¿Porque razón las usa?
Trabajo ☐ Compras ☐ Escuela ☐ Médico ☐ Otra ☐ _____
- ¿Le sirve el sistema de transporte para ir donde Vd. quiere ir?
Sí ☐ No ☐ ¿Si no, por qué no? _____
- ¿Que cambios le gustaría ver en el servicio de la ? _____
- ¿Con qué frecuencia usa un automóvil?
Todos los días ☐ Nunca ☐ Fines de semana ☐ Otra ☐ _____

Si desea recibir más información; asistir a reuniones de planificación de este estudio; o pertenece a una organización interesada en conocer más detalles del estudio, indique su nombre, dirección, teléfono y el nombre de la organización.

NOMBRE TELÉFONO ORGANIZACIÓN
DIRECCIÓN ZIP CODE

COMMUNITY SUGGESTION SHEET

replacement/transit improvement study

SOUTH END ROXBURY
DORCHESTER MATTAPAN

Massachusetts Bay Transportation Authority

FIGURE 5.2

Contact with Agencies

Several meetings were held with the staff of agencies who will be affected by the study. Many of these groups assigned individuals to attend regular Friday meetings as well as Project Working Committee meetings.

Contact with Government Officials

All state representatives and senators, along with federal congressmen and senators with constituencies in the study area were contacted by mail to keep them informed about the progress of the study. Some were briefed personally to keep them up to date on study progress. All or part of 14 state representative districts are located in the study area (see Figure 5.3).

MEETINGS

A three-level program of community meetings was set up to respond to the unique aspects of the study and to further the process of awareness, understanding and commitment by:

1. Maximizing community involvement in the decision-making process (monthly PWC meetings)
2. Maximizing community and agency understanding of and input into the technical process (weekly coordination meetings)
3. Informing people and interesting them in the study (neighborhood meetings)

Project Working Committee Meetings

Project Working Committee (PWC) meetings were held at about monthly intervals during the course of Phase I. In keeping with general procedures set up throughout the Boston area for transportation studies, the PWC was not an appointed or elected group, but was made up of interested citizens who attended the monthly meetings. At these meetings, the MBTA and the consultant team presented interim study findings and received overall direction for the study. Meetings were held at various locations throughout the study area (see Table 5.1 below and Figure 5.4). Minutes of the meetings are contained in Appendix A.

Coordination Meetings

This unique part of the study effort was established to maximize community and agency involvement in the study process. It was recognized that the PWC was too large and did not meet often enough to get closely involved in the technical parts of the study. Therefore, weekly meetings involving the consultant team, the MBTA, other agencies

TABLE 5.1**PROJECT WORKING COMMITTEE MEETINGS**

<u>Date</u>	<u>Location</u>	<u>Major Agenda Item</u>
March 14	Haynes House, Roxbury	Study Introduction
March 29	Lee School, Dorchester	Study Introduction
April 5	Site Office, Roxbury	Identification of Transit Alternatives
May 10	Site Office, Roxbury	Talks by Sec'y of Trans. Frederick Salvucci and BRA Director Robert Walsh
May 24	Site Office, Roxbury	Generalized Alternatives
June 28	Charles Drew Family Life Center, Grove Hall	Analysis of Current Transit Service
July 26	Roxbury Multi-Service Center, Roxbury	Selection of Alternatives for Analyzing Transit Rider Survey Results; Short-Term Improvements
September 14	Shelburne Recreation Center, Roxbury	Update on Transit Alternatives, Short-Term Improvements
October 26	Boston City Hospital, South End	Phase I Recommendations
January 31, 1978	Prince Hall Masonic Lodge, Grove Hall	Phase I Report, Phase II Recommendations

and community people were set up every Friday morning at 8:30 A.M. during the course of Phase I. Attendance averaged 15-20 people and was split about 1/3 consultant, 1/3 agency and 1/3 community. Meeting agendas usually consisted of a description of technical work accomplished during the past week and work anticipated during the following week.

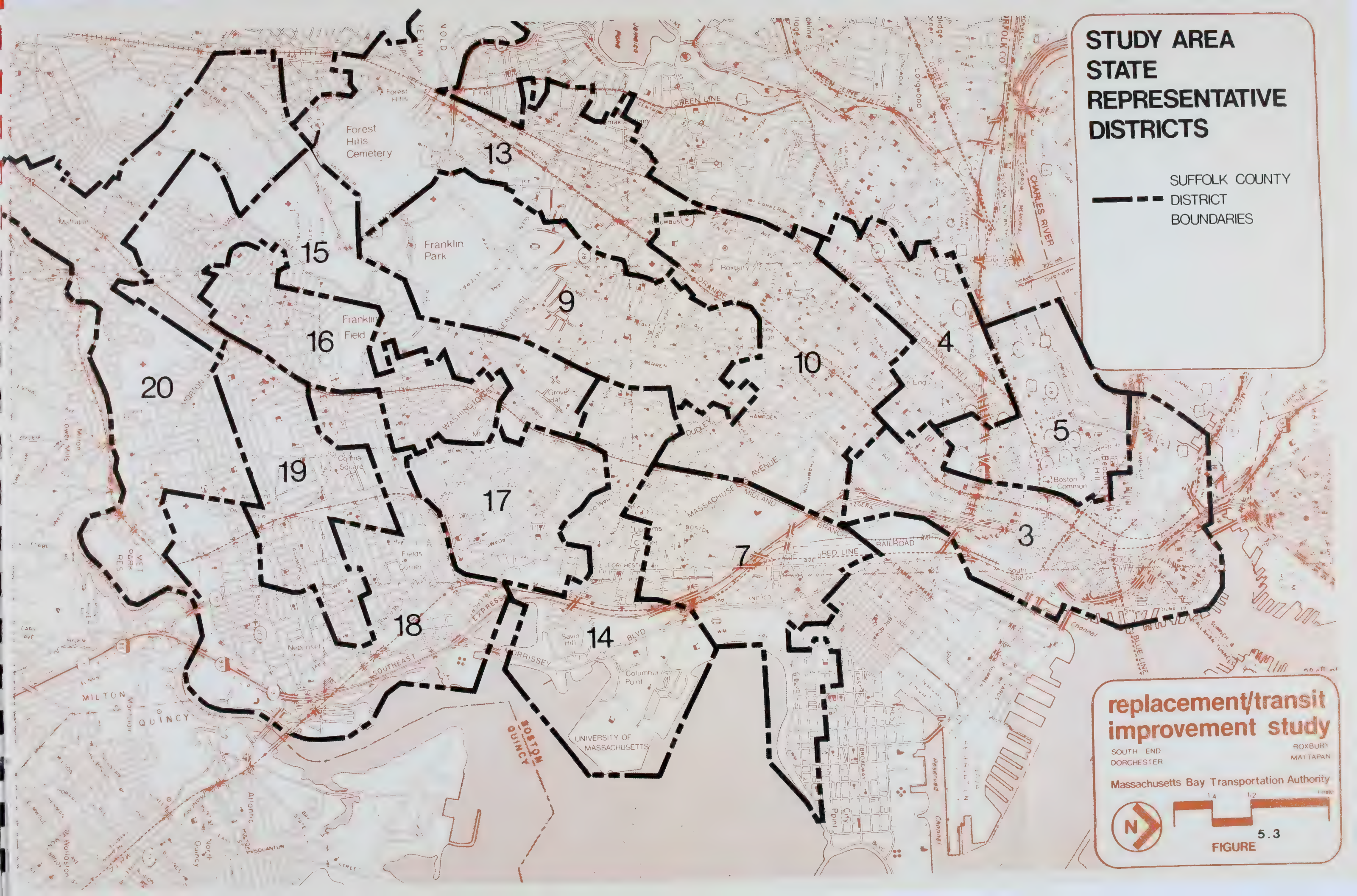
These meetings appeared to benefit both the community and the consultant team. Community input into the technical process was maximized and a number of persons became very interested in and involved with the project. The consultant benefited by being able to show material to a small group before presenting it to the larger PWC. Suggestions made at Coordination Meetings often made material more understandable when it was presented to the general public.

Neighborhood Meetings

It was recognized that the first two levels of meetings could reach only a small proportion of study area residents. It was important to inform others and get more people to come to the PWC and Coordination

STUDY AREA STATE REPRESENTATIVE DISTRICTS

SUFFOLK COUNTY
DISTRICT
BOUNDARIES

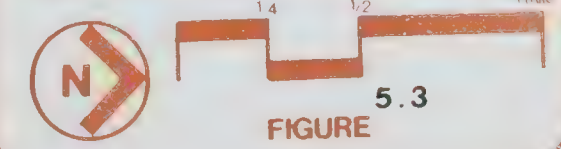


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COMMUNITY MEETING LOCATIONS

- Project Working Committee Meeting Locations
- Neighborhood and Agency Meeting Locations
- * Site Office
90 Warren Street

replacement/transit improvement study

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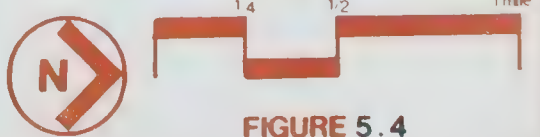
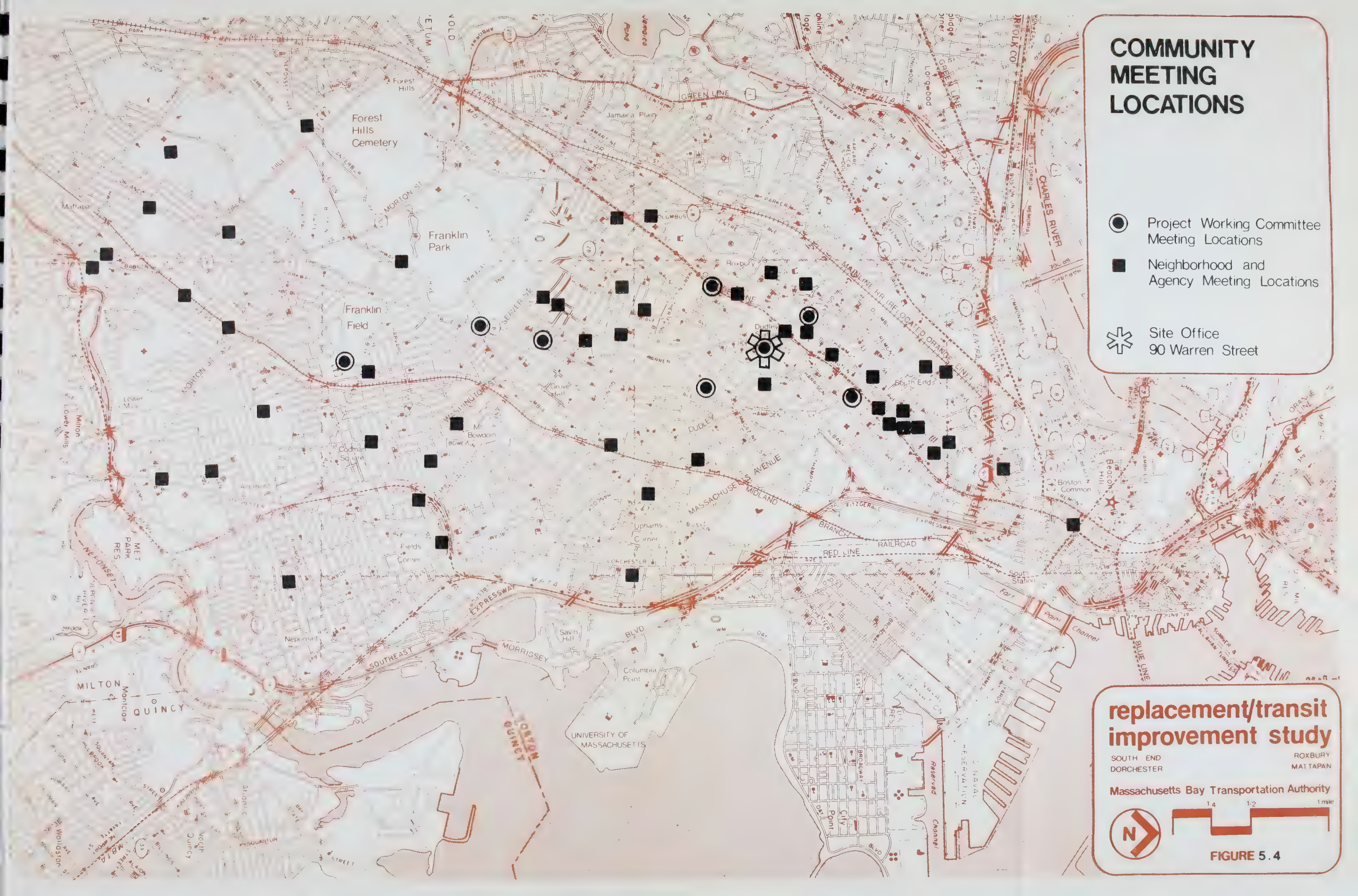


FIGURE 5.4



Meetings. This was particularly true for areas of Dorchester and Mattapan which had not previously been a part of the Southwest Corridor process. Rather than organize meetings from scratch, it was decided to work through the many neighborhood groups already in existence throughout the study area. These groups were contacted and usually were receptive to giving the liaison staff time during their regular meetings. On less frequent occasions, special meetings were set up for the sole purpose of the Replacement/Transit Improvement Study. A schedule of these meetings is given in Table 5.2 and meeting locations are plotted in Figure 5.4.

The neighborhood meetings gave the liaison team a better understanding of the needs of study area residents. They also helped to stimulate attendance at the other types of meetings and to broaden the base of community interest in the project.

ISSUES

Current Transit Service

The study's goal is improvement of the area's transportation system. How people react to potential improvements and various transportation modes depends, to a large extent, on how they feel about the transit system they're now using or not using. Thus, the community was encouraged to express their concerns about transportation at meetings, in questionnaires and by means of individual phone calls. Some of these concerns are shown below:

- "I don't care about new systems. Make the one we have now work!"
- "I think the present transit system is great."
- "Nobody wants a bus."
- "With buses there is no physical evidence of a transit system and people don't believe their bus will come."
- "Why do you change the schedule four times a year?"
- "Can they put two-way radios in the buses?"
- "Come up with a schedule, post it, and follow it."
- "Put route signs on the back of buses."

The crux of these comments was that people were at least initially less interested in future improvements than in current services. To gain credibility for future systems, the liaison team had to deal first with today's problems (see next section).

TABLE 5.2
NEIGHBORHOOD MEETINGS AND PRESENTATIONS

March 14	Haynes House, Roxbury	June 6	Jones Hill Civic Ass'n, Dorchester
March 14	Uphams Corner Little City Hall	June 6	Dorchester Lower Mills Ass'n VFW Post
March 18	Fields Corner Little City Hall	June 7	Mt. Bowdoin Betterment Ass'n
March 18	Mattapan Little City Hall	June 8	Roxbury Youth Resource Center
March 31	8 Streets Neighborhood, South End	June 8	IBA - Inquirinos Boricuas en Accion, South End
April 4	Jones Hill Association, Dorchester	June 9	Freedom House Golden Aires
April 5	Mattapan Board of Trade	June 14	Holland School, Dorchester
April 5	Roxbury APAC	June 15	South End Committee on Transportation
April 6	Union Park Association, South End	June 20	Inquilinos Boricuas en Accion
April 6	Southwest Corridor Coalition Board Meeting	June 21	South End Task Force
April 6	Pilgrim Church, Upham's Corner	July 1	Roxbury Action Program
April 8	Fields Corner Little City Hall	July 5	Ebenezer Baptist Church
April 12	Blackstone School - South End Task Force	July 12	Bay Village
April 12	Mattapan Little City Hall	July 13	Elma Lewis School of Fine Arts
April 13	South End Project Area Committee	July 19	St. Mark's Congregational Church
April 14	Mattapan Block Association	July 20	St. Mary's Catholic Church
April 19	Upton Street Neighborhood Association	July 21	Southwest Corridor Coalition
April 19	Roxbury - North Dorchester APAC	July 23	Mattapan Street Fair
April 19	Haynes House, Roxbury	July 23	Uphams Corner Street Fair
April 19	Columbia Savin Hill Association	July 25	Messinger Street Citizens Group
April 21	Dorchester United Neighbors Ass'n (DUNA)	August 9	Roxbury Highlands Ass'n
April 27	Pope's Hill Neighborhood Ass'n, Dorchester	August 10	113A Paseo Boriken - Spanish Res. Group
April 28	Mass. College of Art	August 16	Dorchester Fair Share
May 1	Rosewood Street Ass'n, Mattapan	September 1	Presentation to City of Boston Agencies
May 2	Tenant Policy Committee	September 2	Roxbury Multi-Service Center
May 3	Mattapan Branch Library	September 25	Union United Methodist Church
May 3	Dorchester APAC	September 26	1701 House Elderly Residents, South End
May 3	Boston School Group (ten 8th graders)	September 26	Melville Park Ass'n, Dorchester
May 4	Southwest Corridor Coalition	September 29	Ronan Neighborhood Ass'n, Dorchester
May 5	Salvation Army Grass Roots Community Group	October 3	Tenant Policy Council
May 9	Gallivan Blvd. Tenants (task force)	October 3	Worcester Sq. Area Neighborhood Ass'n South End
May 10	Mt. Bowdoin Betterment Association	October 4	Dudley Merchants Ass'n
May 10	Women Inc. Halfway House, Roxbury	October 4	Codman Square Civic Association
May 12	Cooper Day Care Parents, South End	October 5	Roxbury Action Program
May 13	Spanish Alliance, Roxbury	October 6	Smith House, Lower Roxbury
May 14	Rosewood St. Association, Mattapan	October 6	DUNA Executive Board
May 17	Manahunt Community School	October 6	Blue Hill Avenue Commission
May 17	Lena Park Civic Ass'n	October 11	Roxbury Highlands Ass'n
May 25	Roxbury Community Health Building	October 11	Jones Hill Civic Ass'n
May 26	Lindsey Street Block Ass'n, Dorchester	October 12	Elma Lewis School
May 31	Tenant Policy Council	October 14	Codman Hill Civic Ass'n
June 2	Roxbury YMCA	October 16	Cathedral Church, South End
June 3	Lower Roxbury Corporation	October 18	St. Mark's Church, Roxbury
June 5	Ashmont Hill Civic Ass'n	October 18	Roxbury APAC
		October 19	South End Project Area Committee
		October 20	Lena Park Civic Ass'n
		October 20	Dorchester United Neighbors Ass'n
		November 2	Lena Park Civic Ass'n

Outside Influences During Phase I

A number of outside forces were acting on the study during this phase which involved frequent shifting of the framework of the study. In all community contacts, particular care was taken to put these events into proper context and indicate their impact on the Replacement/Transit Improvement Study:

- a) The Mayor's Blue Hill Avenue Commission was announced (April, 1977).
- b) The implementation phase of the "Auto Restricted Zone" in the downtown commercial section was announced (September, 1977).
- c) Construction to upgrade the Midland Railroad Line was started (June, 1977).
- d) The City's "Boston Plan" was published (August, 1977).
- e) The Relocated Orange Line engineering and associated community liaison efforts were begun (May, 1977).
- f) Repairs were made to the existing elevated line (August, 1977) including a new contract for emergency steelwork.

Associated Activities (Spin Off Results)

Unanticipated benefits and developments occurred as a result of the study. These included:

- Midland Railroad interim improvements during the Orange Line relocation project
- Survey of current service
- Mutual assistance to and from the Orange Line relocation project
- Additional communication to the community about ongoing MBTA, DPW and BRA programs

Midland Interim Improvements: The study identified a major concern about the Midland Rail Line and its affect on the community. The Dorchester community was concerned that the interim commuter rail service planned for the Midland Branch would not provide their community with any transportation benefits. These concerns were relayed to the MBTA's Southwest Corridor office. The MBTA responded by making a commitment to:

- add 3 new railroad stops on this line
- plan a safety education program for area grade schools
- provide specially designed barriers to prevent unauthorized crossing of the tracks at problem locations

Survey of Current Service: In order to confirm reports of poor bus services, the liaison team in cooperation with MBTA Community Affairs and local temporary employees tallied the performance of several bus routes. The results verified many of the complaints heard within the community, in that a number of runs were not made on one of the routes. As a result, the MBTA is reviewing other bus routes in the system in a similar manner.

Relationship to Orange Line Relocation Project Process: Engineering for the Orange Line Relocation Project started during Phase I of this study. The following liaison activities were incorporated into the study as a consequence:

- Resolving community confusion between the two projects
- Coordinating with community meetings and consultants doing work on the Relocation Project
- Submitting articles on the Replacement/Transit Improvement Study for inclusion in the Southwest Corridor Project Newsletter

Communication about Ongoing MBTA Programs: The intense contact with residents in the study area provided both an opportunity and a responsibility for the MBTA and the consultant team to inform people of current programs that occurred concurrently with Phase I such as:

- Repair of the Elevated Orange Line
- Temporary closing and repair of the Mattapan-Ashmont Trolley Line
- Ashmont Station upgrading
- Crosstown Street design

In addition, basic MBTA service information (maps, schedules, etc.) were distributed at the site office and at meetings.

SUMMARY OF COMMUNITY CONCERNS

A wide variety of community concerns were heard during the course of Phase I, and the major concerns seem to be:

- Providing the service specified on the current schedule is a necessary pre-condition to additional transit improvements.
- Rapid transit services in the study area have been more reliable than buses in the past, increasing the community's skepticism about new bus service.
- Cost of transit system implementation is less important than how the system will stimulate development and employment in the area.

- Payment of fares for transfers in a generally low income area is an added economic hardship.
- Skepticism that the "el" will ever be torn down.
- Concern that the Replacement/Transit Improvement Study will produce a solution acceptable to the MBTA rather than the community.

These concerns will continue to be addressed during Phase II.

**replacement/transit
improvement study**

SOUTH END
DORCHESTER

ROXBURY
MATTAPAN

6

Service Analysis

CHAPTER 6 SERVICE ANALYSIS

INTRODUCTION

This Chapter presents an analysis of current transit service to identify both long and short term transportation improvements indicated for the study area. Following up on potential long-term improvements is an integral part of the Replacement/Transit Improvement Study. Follow-up work on the short-range improvements was outside the scope of the study. However, as will be discussed later, the MBTA performed subsequent work based on information and recommendations from the R/TIS. In some instances, comments are applicable to service outside or at the boundaries of the study area and would not necessarily be resolved by the outcome of this study. These latter issues were discussed during Phase I and are presented here for informational purposes.

The Chapter initially presents a brief evaluation of rail transit services. It then summarizes the MBTA's guidelines for surface transportation. The remainder of the Chapter discusses how existing transit services in the study area measure up to these and other guidelines.

RAIL TRANSIT SERVICE

Overall Evaluation

The two basic rail services in the study area, the Orange Line (on existing and relocated alignments), and the Ashmont Branch of the Red Line (including the Mattapan line), have been described in some detail in Chapter 3.

The Orange Line will be relocated to the boundary of the defined study area. Its stations will be spaced more closely than at present, and its operating speed will be increased due to better alignment and structural characteristics. It will provide direct service to the Prudential and Back Bay areas and have a stop in the South Cove area, all of which are now lacking and are of vital importance due to recent and expected growth of the region's core. As at present, the line will run through the heart of downtown Boston and provide free transfers to the Red, Green and Blue Lines at various points.

The Ashmont Branch of the Red Line serves the eastern edge of the study area. However, due primarily to an inadequate street system, its service area in terms of feeder bus service is somewhat limited. A problem expressed by community residents is the fact that service on the Quincy Branch of the Red Line goes by, but does not stop at, Columbia and Savin Hill Stations, thus cutting down on the service. This split service decreases peak hour frequency on Ashmont and Quincy branches because of capacity in the section between Andrew and Harvard Square Stations. Current peak hour headways are 6 minutes. The Red Line does not have nearly as good downtown coverage as the Orange Line and does not provide a transfer to the Blue Line.

Community Perception of Current Rail Service

Community perception of existing transit service was discerned through two data sources developed for the study. The first source was the one page suggestion sheet shown in Figure 5.2 requesting that respondents provide information concerning level of service usage, reasons for usage, problems with existing services, and recommendations for service improvements. This is an on-going process and, to date, over 250 questionnaires have been completed and returned for review.

Almost half (48%) of the persons filling out suggestion sheets cited inadequate service on the rail lines as conveyed by comments on poor scheduling, long waits or overcrowded conditions. Other major comments concerned poor service to non-downtown points (16%), trains in poor condition (15%) and crime (11%).

The second data source was part of a ridership survey given to passengers using the Orange Line South and selected Red Line Ashmont Branch rapid transit stations (see Appendix B). The survey form provided space for personal comment concerning existing service. Approximately 40 per cent of the 4,500 respondents volunteered comments on rail transit service. Responses from those persons filling out survey questionnaires are given in Table 6.1.

TABLE 6.1
COMMENTS ON RAIL SERVICE FROM RIDER SURVEY

	Percent of Respondents			
	<u>Orange</u>	<u>Red</u>	<u>Green</u>	<u>Overall</u>
Not enough trains	27%	42%	81%	37%
Train in poor condition	15	20	37	19
Poor station conditions	15	8	4	12
Poor winter service	10	10	18	11
Poor climate control	8	10	13	10
Poor service weekends & evenings	7	7	14	7
More express trains	10	4	1	7
Trains not stopping	8	7	0	7
Operating speed too slow	5	7	23	7
Lack of information	5	8	0	6
Persons illegally smoking on trains	6	4	0	5
<u>Good Service</u>	6	6	0	5
Lack of security	5	4	0	4
Poor employee attitudes	3	4	6	4
Poor track conditions	6	1	4	4
Fares too high	4	5	1	4
Not enough crosstown service	2	1	0	1
Operating speed too fast	1	1	0	1
Limited parking at station	2	1	0	2

The Orange Line accounted for 57% of all responses, the Red Line for 38% and the Green Line for 8%. (Note: Green Line comments were made by riders of either Orange or Red Lines who also use the Green Line.)

MBTA SERVICE POLICY GUIDELINES AND STANDARDS

In January 1976, the MBTA adopted its first complete statement of service policy for its conventional surface transit network of bus, trackless trolley and surface streetcar operations. (Note: eventually this policy document will be integrated into a comprehensive public transportation service policy for the Authority, covering surface transit, rapid transit and commuter rail operations, as well as specialized transport services for the elderly and handicapped or other special market groups.) The general purpose of the Service Policy for Surface Public Transportation is to develop a management capability for guiding the operation and improvement of surface transit services within the seventy-nine communities comprising the MBTA District. Specific objectives of the Policy are to:

- Provide a uniform and effective basis for evaluating the relative costs, benefits and overall performance of individual services
- Provide a responsive and effective methodology for establishing new services and improvements to existing services

The intent of this section is to review and summarize those service standards developed by the MBTA Service Policy that evaluate surface transit effectiveness. The standards described in this section will serve, in part, as criteria for this Study to define service deficiencies on existing bus routes, in addition to providing a consistent basis for determining applicability of recommended service improvements.

Service Design Guidelines

These guidelines are used to plan new surface services and modifications of existing routes. Included in this discussion are such characteristics as route spacing, directness of service, route layout, service frequency, span of service, stop spacing, shelters and market potential.

Route Spacing is a measure of transit accessibility which in turn influences the attractiveness of transit service. For regular fixed-route service the following conditions apply:

- In an area with a population density in excess of 4,000 persons per square mile, service will be provided to within at least one-half mile of at least 90% of all residents.
- For regular fixed-route service, the route spacing guide shown in Table 6.2 will be used.

TABLE 6.2
ROUTE SPACING STANDARDS FOR BUS AND
TRACKLESS TROLLEY SERVICE

Population Per Sq. Mi. (thousands)	<u>Average Spacing (Miles)</u>		Route Miles per <u>Sq. Mi.</u>
	<u>Feeder</u>	<u>Crosstown</u>	
Over 12	0.40	0.60	4.00
10-12	0.50	0.75	3.33
8-10	0.60	0.90	2.67
6-8	0.80	1.20	2.00
4-6	1.00	1.50	1.67
2-4	1.00	--	1.00
Under 2	2.00	--	0.50

- The location of service types other than regular-route service will be determined by market potential except that express-type service will not be operated in competition with other services performing a line haul function.

Directness of Service reflects travel times between points and the percentage of transfers made in a transit system; therefore:

- No more than 25% of the bus system's customers should require more than one vehicle to complete their trip by surface transit.
- When two separate routes having common termini exhibit an average transfer rate of 20% or more of total passengers per hour, then the two routes become candidates for linking into one through route.
- Scheduled leave/arrive times for routes having common termini will be coordinated to the maximum extent practicable.
- In instances where a route extension of one mile or less would eliminate a transfer, such extension will be implemented if 20% or more of total passengers make the transfer.

Route Layout will be as direct as possible, avoiding circuitous paths. Deviations from the basic alignment will be minimized, but will not exceed eight minutes round trip and will only be permitted if the market potential is ten new customers per round trip.

Service Frequency or headway will be established to provide a sufficient number of vehicles past the maximum load point(s) on a route to accommodate the passenger volume within the loading standards established (Service Performance Standards). In addition:

- Headways on all regular route services will be set to correspond with clock-face values to the maximum extent practicable.
- Where passenger loads are excessively light, a "policy headway" or minimum service level will be used for regular route service. For regular-route bus and trackless trolley services, a minimum service level of 30 minutes during peak and midday periods will be imposed.

Span of Service applies to the hours and days that new or existing service is to be operated. A "full service route" is one that operates seven days a week and a minimum of sixteen consecutive hours per day. A "partial service route" is one that operates less than seven days a week or sixteen hours a day. All regular route service will operate for a minimum of five days a week (Monday - Friday) and twelve hours a day (6 A.M. - 6 P.M.).

Passenger Stops or bus stops, in residential areas, will be spaced at a maximum of eight per mile. In commercial areas, bus stops will be spaced at a maximum of twelve per mile.

Passenger Shelters are to be placed based on two major factors: the number of boarding and/or transferring passengers at a specific stop and the frequency of service at the stop.

- Shelters should be provided at all stops which serve 300 or more boarding and/or transferring passengers during the course of a typical weekday.
- Guidelines for establishing priorities in the placement of shelters are described in Table 6.3.

TABLE 6.3
BUS SHELTER PRIORITY GUIDE

Total Number of Riders *	Average Peak Period Frequency		
	15 min. or more	5-15 min.	5 min. or less
500 or more	1st	1st	1st
450-499	2nd	2nd	4th
400-449	2nd	2nd	4th
350-399	2nd	3rd	4th
300-349	3rd	3rd	4th

* Boarding and alighting riders during a typical weekday

Market Potential is concerned with the level of demand for proposed transit service. The proposed service should not include demand generated through a duplication of any existing services. The proposed service must meet at least one of the following qualifications:

- The general area to be served must have a minimum average density of 2,000 persons per square mile.
- Projected ridership must average better than 25 passengers per proposed vehicle hour of service.
- Projected ridership must average better than 2.0 passengers per proposed revenue mile of service.

Service Performance Standards

This component establishes guidelines which set minimum performance standards in such areas as operating speed, load factors, economic productivity and schedule adherence.

Speed is a measure of both average operating speed which excludes recovery time and average schedule speed which includes recovery time. Recovery time is defined as the amount of time built into a route's schedule to allow a bus to maintain its schedule through variable traffic conditions during a day. For all existing routes the following conditions apply:

- Any service having an average operating speed (no layover) less than the prevailing system operating standard (11.7 m.p.h. in Spring, 1977) will be considered for an analysis for improvement.
- Any service having an average schedule speed less than the prevailing system schedule standard (8.7 m.p.h. in 1977) will be considered for an analysis for improvement.

Load Factors are expressed as a percent of the seating capacity of a vehicle at the maximum ridership or load point(s) of a particular route. The load standards given in Table 6.4 are maximum standards in that the frequency of service on a route must be set so that the standards are not exceeded during the time period being analyzed. The numbers indicate an average load factor for the entire time period shown. The standards may be exceeded for individual trips within the time periods shown. (Note: even if load factors are at or below standards given in Table 6.4., additional service should be instituted if customers are found to be standing on the vehicle for more than 10 minutes.)

TABLE 6.4
MAXIMUM LOAD STANDARDS

Service Function	(Per Cent of Seats Occupied)			
	Peak 30 Minutes	Total Peak Period	Midday Period	Evening Period
Line haul Bus (Downtown limited stops)	100%	100%	100%	100%
Feeder Bus (Serves rapid transit)	140%	120%	100%	100%
Crosstown Bus (Oriented away from Downtown)	140%	120%	100%	100%
Inter-town Bus (between towns)	140%	120%	100%	100%
Intra-community Bus (serves specific community)	120%	110%	100%	100%
Surface Streetcar (PCC)	210%	160%	100%	100%

Economic Productivity is a measure of actual revenue generated by a service as compared to the cost incurred due to that service. For regular routes, a minimum ratio of revenue to operating cost of 0.3 should be maintained. For premium routes (i.e., express buses), this ratio should be a minimum of 0.5. In addition:

- A service must maintain an average of at least 15 passengers per revenue hour during the time period being analyzed.
- A service must maintain passenger per mile averages of 2.5 for peak periods and 1.5 for off-peak periods.

Social Standards. For a service where either 60% or more of the average daily ridership is transit-dependent (no automobile available for the trip) or 25% or more of the average daily ridership is elderly and/or handicapped, then the following economic productivity standards will apply:

- A minimum ratio of revenue to operating cost of .15 for regular route service and .25 for premium service.
- At least 10 passengers generated per revenue hour during the time period being analyzed.
- Passenger per mile averages of at least 2.5 for peak periods and 1.0 for off-peak periods.

Environmental Standard. If the number of automobile vehicle miles of travel (VMT) reduced through operation of the service totals 200 or more per revenue hour operated during the time period being analyzed, then the economic productivities given for Social Standards will be effective.

System Impact Standard. If 60% or more of the patrons of a service transfer to another service during the time period being analyzed, then the economic productivities given for Social Standards will be effective.

Schedule Adherence. Time of departure at the terminal points of a route will be exact. Approximate "leave" times will be determined at intermediate points (i.e., major street intersections and activity centers) along a route. No trip will leave a terminal point ahead of the scheduled "leave" time. Standards of schedule adherence are that 95 per cent of all services having 10 minute or longer headway and 80 per cent of other services must stay within 5 minutes of schedule.

COMMUNITY PERCEPTION OF CURRENT BUS SERVICE

Comments on Existing Bus Services

Comments on bus service received from the two data sources described previously are tabulated in Table 6.5. The most commonly expressed concern pertained to schedule adherence. Over forty percent of the respondents from both surveys mentioned poor schedule adherence as a chronic problem. Schedule adherence was often described as excessive waiting, or, "buses always running late."

TABLE 6.5
COMMUNITY COMMENTS ON BUS SERVICE

<u>Comment</u>	Percent of Respondents	
	<u>Rider Survey</u>	<u>Suggestion Sheets</u>
Poor Schedule Adherence	42%	44%
Overcrowding	34%	47%
Poor Driver Attitude	15%	5%
Smoking on Bus	10%	6%
Dirty Buses	9%	7%
Slow Service	9%	12%

Over one hundred persons out of a total of 700 respondents in both surveys cited cases where buses did not arrive, particularly during evening periods. In many instances respondents mentioned that they would not use the system because of poor schedule reliability and excessive waiting, particularly during evening periods. Although many routes were listed, Route 29 - Mattapan to Egleston and Route 44 - Seaver Street to Dudley were cited as severely deficient in schedule reliability.

Other critical comments concerned overcrowding and excessive travel times. Route 22 - Ashmont to Dudley via Talbot, Route 23 - Ashmont to Dudley via Washington, Route 29 - Mattapan to Dudley, Route 44 - Seaver Street to Dudley, Route 43 - Egleston to Park Street and Route 45 - Franklin Park to Dudley were cited by users of these lines as chronically overcrowded. Route 44 - Seaver Street to Dudley via Humboldt Avenue was consistently mentioned as having slow service.

A number of comments involved the condition of equipment and bus driver attitude. Approximately 9 per cent of the respondents from the rider survey cited buses that are constantly dirty with debris (paper, cans, bottles, etc.) and 15 per cent of the respondents cited discourteous bus drivers who refuse to give information when requested. Although these conditions were cited for routes throughout the study area, Route 29 - Mattapan to Egleston received a considerable number of complaints concerning inconsiderate bus drivers. Several respondents said that bus drivers occasionally failed to stop at designated bus stops during periods when the bus was not crowded. Violation of the no smoking provisions was ranked fourth in the rider survey.

Comments Pertaining to New Services

A wide variety of suggestions for new services or for modifications of existing services were received from the community. However, in most cases the number of common suggestions for a recommended new service were few.

There were two exceptions to this. A considerable number of respondents mentioned that existing MBTA services to the Back Bay are too time consuming because of transfers and circuitous routing. (Note: the relocated Orange Line will help alleviate this problem.) In addition, many respondents in the Mattapan - Franklin Field areas expressed a desire for direct bus service to Dudley Station. Currently, access to Dudley from these areas requires a transfer from the Route 29 bus at either Egleston Station or Grove Hall.

TECHNICAL EVALUATION OF CURRENT BUS SERVICE

Residential Coverage

To a large extent, the attractiveness of a particular bus route is determined by its accessibility to persons along the route. A simple measure of this variable is the distance between the route alignment and origin of the user's trip. To measure accessibility, a maximum walk of 1/4 mile to a bus route or 1/2 mile spacing between routes was used as a standard. The 1/4 mile service area (equivalent to approximately a 5-minute walk) is a national guideline recommended by the Institute for Transportation of the American Public Works Association in 1973 and is equivalent to the MBTA

standards of 1/2 mile spacing of routes in an area having the population density of the study area (see Table 6.2). Superimposing this standard on a map of study area population produced the results shown in Table 6.6.

Table 6.6 shows that the vast majority of study area residents are provided access to at least one bus route. Service coverage ranges between 98 per cent of study area population during peak periods to 96 per cent during evening periods. Thus the study area has excellent overall transit coverage.

Directness of Service

This is a measure of how closely service corresponds to the paths that people want to travel. One measure of determining the directness of service is to evaluate transfers required in order to complete a particular travel desire. Another is total trip time. This analysis describes existing study area bus services in terms of three generic travel desires:

- Travel between the study area and downtown Boston
- Travel within the study area
- Crosstown travel

TABLE 6.6
RESIDENTIAL COVERAGE OF BUS SERVICE

<u>Time Period</u>	<u>Population within 1/4 Mile of Route (1/2 mile spacing)</u>	<u>Population Outside 1/4 Mile Limit</u>	<u>Areas Outside Limit</u>
<u>Daily Peak Period</u> (maximum service, 6:30 - 9:30 AM, 3:30 - 6:30 PM)	213,700 (98%)	4,300 (2%)	Sections of: Eastern and Western Mattapan, Frank- lin Field and Franklin Field South
<u>Daily Base and Evening Periods</u> (all times other than peak period)	211,000 (97%)	7,000 (3%)	Areas listed above, plus eastern section of Frank- lin-Harvard neighborhood
<u>Evening Period</u> (minimum daily service, 6:30 PM - 1:00 AM)	208,800 (96%)	9,200 (4%)	Areas listed above, plus section of Uphams Corner- Jones Hill neighborhood in Dorchester and section of South End between Dover and Northampton Stations

This analysis is more qualitative than quantitative due to a scarcity of data on transit riders' travel characteristics. However, the MBTA has a system-wide data collection survey planned for Spring, 1978, which should provide the data required for a quantitative evaluation of current transfer activity.

Travel Between the Study Area and Downtown Boston

The vast majority of bus routes in the study area provide feeder services to either the Orange Line or Red Line Ashmont Branch, which, in turn, provide service to the Boston Central Business District (not including Back Bay). Few bus routes within the area provide direct downtown accessibility because of a generally poor downtown street system with traffic congestion, and a good downtown-oriented rail system. Exceptions are Route 43 - Egleston to Park Street via the Boston Common Loop which provides direct downtown service to parts of Roxbury and the South End, and Route 49 - Northampton to Kneeland Street which provides service to the southern edge of downtown along Washington Street in the South End except during evening periods.

In general, the existing bus network provides good service to the Boston CBD from the study area since, for the vast majority of residents, the bus network provides relatively direct feeder services to either the Red Line or Orange Line. However, this system requires transfer time at a station and payment of an additional fare.

Trips Within the Study Area

Since the existing bus network primarily functions as a rapid transit feeder system, direct service linkage of points within the study area often takes a secondary role. Travel within and between neighborhoods often requires at least one transfer between buses, and this transfer is likely to be made at rapid transit stations which are not always conveniently located. Transfers between bus routes are particularly difficult if routes do not adhere to schedule.

Possibilities for direct bus service within and between Roxbury and North Dorchester are relatively greater than other neighborhoods due to the greater frequency of routes within these neighborhoods. Only limited service is possible from the Franklin Field and Mattapan areas where multiple transfer requirements are necessary for many trip desires.

In addition to the travel constraints imposed by transfer requirements, the impact of an additional fare for each transfer must be considered in an area where median income is well below average.

Crosstown Travel

Since most bus service terminates at rapid transit stations, crosstown travel to areas east of the Ashmont Line and west of the Orange Line generally requires transfers between buses or between bus and rapid transit. Dudley Station, where buses from the Fenway area, Brookline,

Allston and Cambridge terminate, is the major transfer point. Most neighborhoods of the study area have direct bus service to Dudley. However, getting from Mattapan and Franklin Field areas to Dudley Station requires transfer to the Orange Line at Egleston or to another bus at Grove Hall, which is a serious shortcoming in the service. Some crosstown trips require that three fares be paid.

Direct service to the Back Bay (Copley Square - Prudential area) is limited to sections of the South End within the service areas of Route 9 - City Point to Copley and Route 68 - East Concord Street to Copley. Access between South Dorchester and the remainder of the study area requires a transfer at either Fields Corner or Ashmont Stations.

Quantitative Measures of Performance

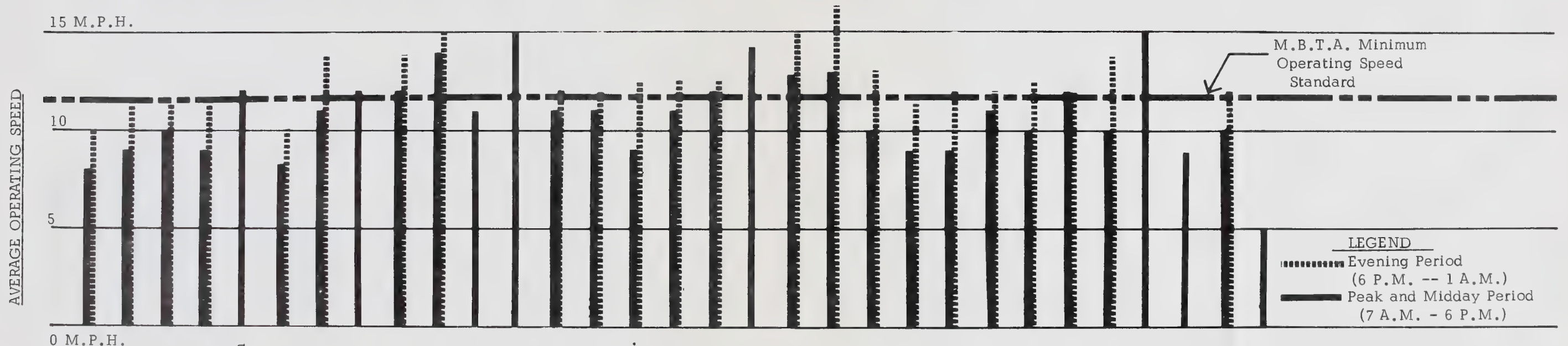
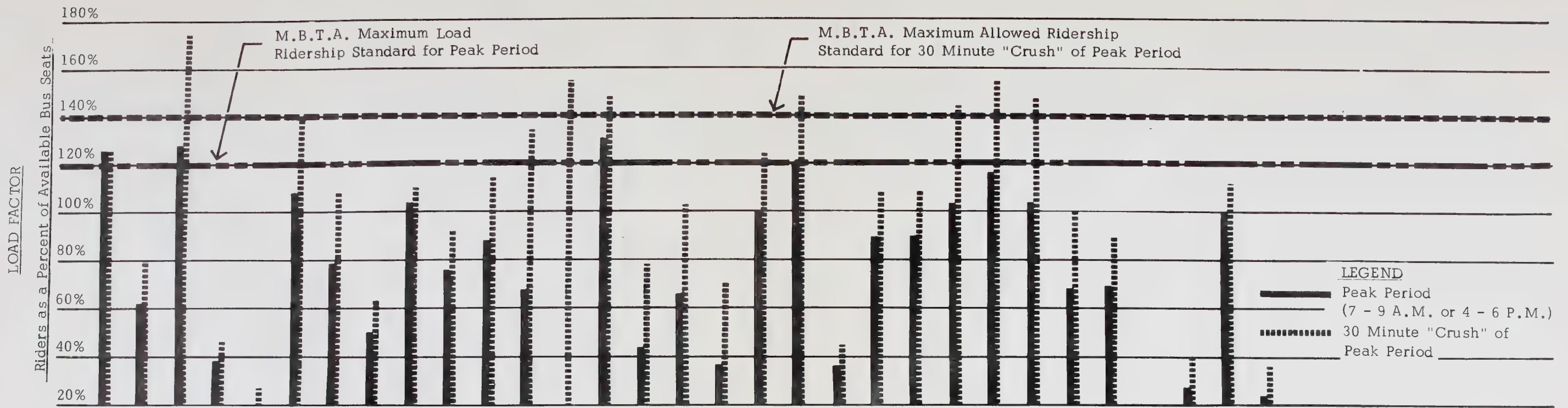
The MBTA Service Policy has categorized routes having average operating speeds in the lowest 25 percentile of the MBTA system as deficient. For Spring, 1977, this minimum operating speed standard was approximately 11.7 m.p.h. Figure 6.1 compares study area bus routes to this standard.

Approximately two-thirds of all study area routes for peak and mid-day periods have operating speed deficiencies of varying degrees. During the evening period, routes with sub-standard operating speeds comprise approximately one-fifth of all routes in the study area.

Route 68 - Copley to East Concord Street in the South End, has the lowest operating speed (5.3 m.p.h.) of all routes surveyed, primarily because of its circuitous routing. Route 1 - Harvard to Dudley, Route 8 - Columbia Point to Dudley, Route 10 - City Point to Dudley, Route 15 - Kane Square to Dudley, Route 49 - Northampton to Kneeland Street, and Route 68 - Copley to East Concord Street have operating speeds below 9 m.p.h. during peak and midday periods.

Major causes of low operating speeds in the study area are traffic congestion (particularly the problem of double-parked vehicles during the midday) and excessive bus stop dwell times (amount of time required for boarding or disembarking) due to heavy ridership.

Figure 6.1 also compares the number of riders counted at maximum load points with the number of available bus seats. Data are tabulated for two periods, the entire two hour peak and a 30-minute "crush" or highest loading during the peak period. These data are then compared with MBTA standards (see Table 6.3) or 120% of seating capacity during peak periods and 140% during the "crush" period. As Figure 6.1 shows, Routes 1, 9, 15, 22, 23, 29, 43, 44 and 45 all have rider levels above the MBTA standards. In addition, several other routes exhibit ridership levels that approach maximum standards.



Route

1 Harvard - Dudley
 8 Columbia Pt. - Dudley
 9 City Point - Copley
 10 City Point - Dudley
 13 Savin Hill - Northampton
 15 Kane Sq. - Dudley
 16 Egleston - Andrew
 16A Forest Hills - U. Mass.
 17 Fields Corner - Andrew
 18 Ashmont - Andrew
 19 Fields Corner - Dudley
 21 Ashmont - Forest Hills
 22 Ashmont - Dudley
 23 Ashmont - Dudley
 25 Ashmont - Gallivan Blvd.
 26 Ashmont - Norfolk St.
 27 Ashmont - Mattapan
 28 Arborway - Mattapan
 29 Egleston - Mattapan
 30 Roslindale Sq. - Matt.
 41 Dudley - Centre & Eliot
 42 Dudley - Egleston
 43 Egleston - Stuart St.
 44 Dudley - Seaver St.
 45 Dudley - Franklin Park
 46 Dudley - Heath
 47 Central Sq. - City Hsp.
 48 Dudley - Boston State
 49 Northampton - Kneeland
 66 Dudley - Allston
 68 Copley - E. Concord St.

replacement/transit improvement study

SOUTH END
DORCHESTER

ROXBURY
MATTAPAN

Massachusetts Bay Transportation Authority
**BUS PASSENGER
 LOADING AND
 OPERATING SPEED**
 FIGURE 6.1

Economic Productivity

Table 6.7 indicates ratios of revenue to operating cost for routes in the study area in the Spring of 1977.

Routes having ratios below the MBTA minimum standard for economic productivity of 0.3 are denoted in Table 6.7 and include Routes 8, 13, 18, 19, 25, 26, 27, 30, 46 and 49. Although some of these routes probably qualify for the reduced minimum standard of .15 based on social considerations, data to confirm this are not currently available. It should be noted that the Authority's highest ratios of revenue to operating cost for local buses are found in the study area, particularly Routes 1, 15, 17, 22, 23, 43, 44, 45 and 47.

Also included in Table 6.7 is the average number of round trips scheduled on an average weekday. Note that, with few exceptions, the economic productivity of a route is closely correlated with the frequency of its service (as measured in weekly round trips). The reasons for this are fairly obvious. Routes which show good rider potential and economic productivity are more likely to have their service increased and this in turn generates more riders and a higher revenue/cost ratio.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The major conclusions from the service analysis are listed below:

1. Improving adherence to its current schedule should be top priority for the MBTA. Many users and potential users of the transit system have been put off by problems of long waits at a bus stop, and increasing reliability is as important or perhaps more important, than increases in scheduled service.
2. Rapid transit service for most parts of the study area is reasonably good and should be further improved when the relocated Orange Line is constructed. The major concern is that Quincy Line trains do not stop at Columbia Station.
3. Many residents want direct service to Dudley from Franklin Field and Mattapan neighborhoods. This service should be instituted on at least a trial basis in the future.
4. Overall bus speeds in the area are low and can be improved by increasing frequency of service on some routes (thereby reducing the number of boarding and alighting passengers) and by making traffic engineering improvements (see Chapter 7).
5. Routes 1, 9, 15, 22, 23, 29, 44 and 45 are often overcrowded and should be analyzed for possible service frequency increases.

TABLE 6.7
RATIO OF REVENUE TO OPERATING COST FOR BUSES

	Route	Revenue/ Operating Cost Ratio	Weekday Round Trips
1	Harvard - Dudley	.847	128
8	Columbia Pt. - Dudley *	.294	40
9	City Point - Copley	.542	82
10	City Point - Dudley	.462	66
13	Savin Hill - Northampton*	.254	29
15	Kane Sq. - Dudley	.556	89
16	Egleston - Andrew	.339	52
16A	Forest Hills - U. Mass.	.339	12
17	Fields Corner - Andrew	.606	75
18	Ashmont - Andrew*	.297	23
19	Fields Corner - Dudley*	.227	17
21	Ashmont - Forest Hills	.355	31
22	Ashmont - Dudley (via Talbot)	.541	93
23	Ashmont - Dudley (via Washington)	.581	95
25	Ashmont - Gallivan Boulevard*	.222	51
26	Ashmont - Norfolk Street*	.238	64
27	Ashmont - Mattapan*	.283	31
28	Arborway - Mattapan	.325	18
29	Egleston - Mattapan	.571	130
30	Roslindale Sq. - Mattapan*	.279	40
41	Dudley - Centre & Elliot Sts.	.387	97
42	Dudley - Egleston	.339	68
43	Egleston - Stuart Street	.498	97
44	Dudley - Seaver Street	.411	95
45	Dudley - Franklin Park	.553	86
46	Dudley - Heath & S. Huntington*	.178	28
47	Central Sq. - City Hospital	.573	61
48	Dudley - Boston State Hospital	N/A	2
49	Northampton - Kneeland Street*	.193	24
66	Dudley - Allston	.518	108
68	Copley - E. Concord Street	.406	32

* Routes with ratios below MBTA minimum
desirable level of 0.3

Source: MBTA Summary Table of Selected Operating Measures -
Spring, 1977

6. Additional crosstown bus service to Back Bay and Fenway areas from the Uphams Corner area should be considered (Note: the computer ridership analysis indicated heavy demand for this service).
7. Consideration should be given to posting schedules at bus stops and providing free transfers between areas.

Immediate Action

Increasing the reliability of current service in the study area became a high priority item for the Authority. The MBTA Department of Community Affairs and Marketing collected data on schedule reliability by observing actual bus arrivals at selected points along the routes and comparing them to schedules. The three routes selected: 15 - Kane Square to Dudley, 29 - Mattapan to Egleston, and 44 - Seaver Street to Dudley, were most often cited for poor service by area residents participating in the study. The observations indicated some problems with schedule adherence, particularly on Route 44. This route has been identified as one needing close supervision and a Characteristics Study. Close scrutiny of this route should help to improve the service.

An important by-product of this survey is that many area residents are now aware of what information to include in service-related complaints. More specific information should allow the MBTA to respond better to area residents' requests and complaints.

**replacement/transit
improvement study**

SOUTH END
DORCHESTER

ROXBURY
MATTAPAN

7

Technology Analysis

CHAPTER 7 TECHNOLOGY ANALYSIS

INTRODUCTION

This chapter reviews current "state-of-the-art" transit technology to identify vehicle and service options most appropriate to the transportation requirements of study area residents and operating requirements of the MBTA. The major transit modes listed below are analyzed in terms of their specific advantages and disadvantages and possible role in the study area.

1. Bus (local and express)
2. Trackless trolley
3. Light rail vehicle (trolley)
4. Rapid transit
5. Commuter rail
6. Personal rapid transit (PRT) systems
7. Dual-Mode vehicles
8. Monorail

The first five modes currently are operating in Boston and in many other cities throughout the world. Of the remaining three modes, PRT and Monorail have had limited application in this country while dual-mode systems have not been implemented anywhere.

Tables 7.1 and 7.2 compare operating and cost characteristic of the traditional modes 1 through 5. Table 7.1 compares general operating characteristics of these modes in terms of achievable speeds, capacity fuel consumption, noise and operating costs based on statistics obtained nationwide. Table 7.2 compares data on specific vehicles currently operated or purchased by the MBTA.

The remainder of this chapter will discuss characteristics of each mode individually, examine methods of improving operational characteristics and look at the cost of implementation.

BUSES (LOCAL AND EXPRESS)

Description

Buses are the most widely used form of urban mass transit in the United States today. Every city having fixed-route public transportation relies at least partially on buses. Buses can operate over local streets in general traffic or in semi-exclusive and totally exclusive rights-of-way. Examples of buses operating on exclusive rights-of-way in downtown areas include Washington Street in Chicago, Market Street in Philadelphia and Canal Street in New Orleans. In many instances, exclusive bus rights-of-way were formerly used by trolleys.

TABLE 7.1
TYPICAL TRANSIT MODE OPERATING CHARACTERISTICS

Operating Parameter	Commuter Rail	Rapid Transit	Light Rail	Express Bus	Local Bus	Trackless Trolley
Average Speed (mph) (including stops)	20-40	15-30	5-10-mixed street traffic 10-15-median reservation 20-25-exclusive ROW	20-40	5-15	5-15
Average Station Spacing (miles)	1-6	.5-2.0	.1-1.0	1-6	.1-.5	.1-.5
Typical Minimum Average Headways (minutes)	5	1.5-2.0	.5-mixed street traffic to 2.0-exclusive ROW	.25-exclusive ROW	.75-2.0	.75-2.0
Maximum Capacity Range (Passengers/Hour Per Lane or Per Track)	6,000	40,000 to 60,000	4,000-mixed street traffic 10,000-median reservation 25,000-grade separated	12,000-grade separated (No Stops)	2,000-mixed street traffic 4,000-median reservation	2,000-mixed street traffic 4,000-median reservation
Fuel Consumption (vehicle miles per gallon)	.75 mpg	2-3 mpg	3 mpg	4-6 mpg	3 mpg	4 mpg
Wayside Noise (dBA)	80-97	80-90	68-80	80-88	85-90 (accelerating condition)	73-81
Typical Vertical Alignment	Elevated At-grade	Elevated Depressed At-grade, grade separated	Elevated At-grade Depressed	At-grade	At-grade	At-grade
MBTA Typical Operating Cost (\$/vehicle mile)	\$4.85	\$4.95	\$6-10 (PCC)	\$2.00	\$2.70	\$3.40

Sources: DeLeuw, Cather/STV, Characteristics of Urban Transportation Systems, May, 1975
Minuteman Area Transit Study (MATS), Technical Memorandum No. 11 - Transit Technology, MBTA, January, 1977
Institute of Traffic Engineers, Transportation and Traffic Engineering Handbook, 1976
1976 Program for Mass Transportation

TABLE 7.2
SUMMARY OF SPECIFIC VEHICLE DATA

	Mini-Bus	Local Bus	Express Bus	Trackless Trolley	PCC Trolley	Boston LRV	New Orange Line Cars	RDC "Budd Cars"
Maximum Speed (mph)	50-65	50-65	50-65	50	42	50	65 mph	80
Acceleration (mph/sec)	3	2	2	3	2	3	2.5	1.5
Platform	Low Level	Low Level	Low Level	Low Level	Low Level	Low Level*	High Level	High & Low Level
Dimensions - length	18-25	40'	40'	40'-0"	46'-47'	73'	65'-4"	85'-0"
width	7-8	8'-6"	8'-6"	8'-5"	8'-4"-8'-8"	8'-10 1/4"	9'-3"	10'-3/8"
height	7-9	10'	10'	10'-0"	11'-1"	11'-4"	11'-11 3/4"	14'-7"
Minimum turning radius (feet)	30'	40'	40'	40'	40'	32'	53'	275'
Maximum Grade (%)	10	10	5	10	10	9	4	4
Capacity - seated	15-25	25-50	50	40	42	52	58	48-94
standing	10-20	50	-	51	81-88	108	158	-
Nominal Weight (Tons)	6-10	14	12	14	29	43	48	60'
No. of Doors	2	2	2	2 on right 1 on left	1 on left 2 on right	3 on each side	3 on each side	2 on each side
Vehicle Cost (1977)	\$15,000-\$30,000	\$75,000	\$75,000	\$105,000	(\$100,000 to rehabilitate)	\$650,000	\$600,000	(\$ 325,000 to rehabilitate)

Sources: 1976 Program for Mass Transportation
Transportation and Traffic Engineering Handbook, Institute of Traffic Engineering, 1976
Light Rail Transit - A State of the Art Review - USDOT-UMTA (DOT UT 50009), Spring 1976

* Potential for conversion to high level

Transit buses normally have about 50 seats with provision for standees. Articulated buses (which are longer but can make the same turns as conventional buses) provide up to 50% more capacity. The MBTA has recently submitted an amended capital grant application to the UMTA to purchase ten articulated buses.

As shown in Table 7.1, buses operating on surface rights-of-way shared with other vehicles can provide a maximum capacity of about 2,000 passengers per hour. Providing an exclusive guideway (median reservation) on the street increases capacity to about 4,000 passengers per hour. In exceptional circumstances, express buses on completely grade-separated right-of-way have carried up to 25,000 passengers per hour. However, providing grade-separated express bus service in the R/TIS study area may prove difficult due to lack of limited access highways and available rights-of-way for this kind of activity.

A study of several U.S. cities in 1973 showed that operating costs per vehicle mile for local buses ranged between \$0.80 - \$2.35, and that operating costs per vehicle mile for express buses ranged between \$0.70 - \$2.35. Available data on operating costs for buses in Boston are in agreement with these ranges. For example, local bus route 77 (Harvard Square - Arlington Heights) had an operating cost of \$2.25 per vehicle mile in 1974*, and express route 304 (Watertown Square - Sumner & Quincy) had an operating cost of \$1.54 in 1974*. Similar data for buses operating in the study area were not available.

Vehicle costs for mini-buses range between \$10,000 and \$30,000**, and local and express buses cost in the range of \$70,000 - \$100,000 each depending upon special features such as air conditioning and facilities for the handicapped.

Evaluation

The primary advantages and disadvantages of a bus are given below:

Advantages

1. The ability to operate on most existing streets without new construction
2. The ability to penetrate new market areas at low cost
3. The ability to provide frequent stops
4. The flexibility to change routes in response to passenger demand changes or to test trial routes (However, most bus routes have been fixed for many years as either streetcar, trackless trolley or bus routes)
5. Relatively small capital expenditure for maintenance facilities compared to fixed rail modes

* Source: Staff Report 2-EOTC, February 19, 1976

** A typical \$10,000 mini-bus would be a Fortivan Commuter having 16 seats. A typical \$30,000 mini-bus would be a Mercedes Benz 0309D having up to 23 seats. (Source-"Small Transit Vehicle Survey", June, 1975, Report No. DOT-TSC-OST-75-17)

Disadvantages

1. Difficulty in maintaining fixed route schedules and low operating speeds due to conflict with vehicular traffic congestion (although this can be alleviated by providing exclusive R.O.W.)
2. High operating costs required to accomodate high passenger volumes because of limited capacity
3. Higher source air pollution than electrically- powered vehicles
4. Higher noise than LRV's or trackless trolley
5. Limited roadway capacity in downtown to accomodate large number of buses

Applicability to Study

Buses presently perform a vital function in providing transportation services to residents of the study area. They provide local service or run as feeder systems to stations on the existing Orange and Red Lines for trip lengths of greater distances.

Buses will continue to play an important role in the total transit plan for the study area as feeders to higher capacity transit modes and possibly as line haul systems. Where higher passenger capacities are required (say, greater than 2,000 passengers per hour), buses can offer adequate service only if exclusive right-of-way is provided to minimize interference with other vehicles.

TRACKLESS TROLLEY (OR TROLLEY-BUS)

Description

Trackless trolleys are buses using an overhead electrical power source and, therefore, combine certain characteristics of streetcar and bus. Trackless trolleys replaced many of the streetcar lines in Boston because of traffic congestion problems caused by streetcar-auto conflicts where reserved medians were not available.

In the 1960's, the majority of trackless trolley lines were themselves replaced by buses.* Only three lines now operate in the Boston area: Watertown to North Cambridge, Waverly to North Cambridge, and Huron Avenue to Harvard. These lines all run through the former streetcar tunnel at Harvard Square and were not converted because of tunnel ventilation problems with diesel buses. All three lines are serviced in the Bennett Street garage near Harvard Square. In recent years, the initiation of new environmental standards for air and noise pollution has presented new arguments for retaining the remaining trackless trolley routes.

Trackless trolleys can operate along city streets. The basic fixed facility requirements is the overhead power supply system. Unlike the

* Economic reasons were cited although apparently no detailed cost analysis was made.

light rail vehicle which uses its rail for grounding, the trackless trolley (with rubber tires) requires a second overhead wire for grounding. In mixed street traffic, passenger capacities are the same as buses (approximately 2,000 passengers per hour). Accommodating more passengers while maintaining a reasonable operating speed requires an exclusive right-of-way.

Operating costs for trackless trolleys in Boston are slightly greater than for diesel buses. The two major items increasing the cost of trackless trolleys over diesel buses are the cost of electric power and maintenance of the overhead electrical power system. The 1976 Program for Mass Transportation (PMT) estimates the operating cost of a trackless trolley to be approximately \$3.40 per vehicle mile as opposed to \$2.70 for buses. The difference in power costs is illustrated by the fact that in 1974 the fuel cost for MBTA diesel buses averaged 9.6 cents per vehicle mile whereas the fuel cost for trackless trolleys was 23.5 cents per vehicle mile.

The main reason for this major discrepancy is the current MBTA power system which consists of two 25 cycle power generating plants, 23 power sub-stations, and approximately 225 miles of transmission and distribution system conduit and cable. The Authority is the only transit company in North America still generating its own power. The system, which was constructed in 1911, is obsolete and inefficient. Twenty-five cycle systems were long ago replaced by 60 cycle systems. Because of the age and unreliability of the system, failures and shutdown are common occurrences, and operating costs are excessive. To correct this situation, the MBTA is reconstructing 17 of its 23 sub-stations and by 1981 will be purchasing its electrical power from Boston Edison. These measures will reduce the MBTA operating cost and bring it closer to the nation-wide average.

These changes should also reduce trackless trolley fuel consumption below that of buses. Table 7.1 shows that trackless trolleys can be operated for 4 miles per gallon (mpg) as opposed to 3.3 mpg for buses. Currently, the fuel required to power MBTA trackless trolleys averages more than one gallon per vehicle mile (Source: 1976 PMT).

Evaluation

The general advantages and disadvantages of trackless trolleys can be summarized as follows:

Advantages

1. Potential savings in diesel fuel
2. Vehicle has quiet accelerating characteristics
3. Vehicle does not generate air pollutants within area served (permits use of tunnel)
4. Ability to provide frequent stops

Disadvantages

1. Restriction to overhead power alignment results in low service flexibility (or increased costs to build overhead power)

2. Esthetic problem with overhead power distribution system
3. Higher capital and operating costs than diesel buses without providing greater capacity
4. Lack of existing maintenance facility in study area
5. Some difficulty in passing disabled vehicle

Applicability to Study

Introduction of trackless trolleys into a fleet which currently exists almost entirely of diesel buses will almost certainly result in higher capital and operating costs than if an equivalent number of buses were added. A significant factor is that the only existing maintenance facility for trackless trolleys is located in Cambridge. A new maintenance facility would have to be built in the study area, or perhaps bus Route 1 (Harvard to Dudley) running to Cambridge could be converted to a trackless trolley line which could provide access for all lines in the study area.

A decision based on economic grounds alone would be against trolley buses. On the other hand, reduced noise and air pollution are important factors and warrant the inclusion of trackless trolleys as a potential transportation mode for the study area.

LIGHT RAIL TRANSIT (TROLLEY)

Description

Light rail transit is a generic name for a transit mode consisting of electrically powered steel-wheeled rail vehicles operating predominantly on exclusive rights-of-way. This latter characteristic is the primary feature which distinguishes light rail transit from the electric streetcar (streetcars typically share right-of-way with other vehicular traffic on public, often congested roadways).

Light rail transit is an intermediate-capacity, intermediate-speed mode capable of operating at passenger volumes and service levels between those of fully-separated rapid transit and those of transit operating on public streets or roadways in mixed traffic. It is characterized by flexibility which provides planners with a variety of options in locating and/or relocating routes, and in selecting and utilizing a number of different operating procedures. It can be placed in subways, on the streets, on elevated structures, on private right-of-way with or without grade crossings, in the median of highways, and on abandoned railroad rights-of-way.

The majority of trolleys presently in service in Boston and elsewhere in the U.S. are President's Conference Committee (PCC) car type. These cars were built between 1941 - 1951 and have an approximate capacity of 125 passengers per car (seated and standees). They have a maximum speed of 42 MPH.

The new standard light rail vehicle (LRV) now operating in Boston and soon to be operated in San Francisco represents a significant improvement in ride quality and comfort. Each car has a capacity of about 160 passengers and can achieve speeds of 50 MPH. The San Francisco LRV's will have high-low steps activated by the operator, that will permit high platform operation (with faster passenger loading times) in a downtown subway while retaining low platforms outside the subway. The Boston LRV's have low platform capability only, since the Green Line Central Subway does not have high level platforms. LRV's can be operated with up to four cars per train.

The MBTA ordered a total of 175 LRV's to replace most of its existing PCC's. As of November, 1977, the MBTA had accepted 43 cars and has encountered a host of maintenance and operational problems with these cars. Problems have included minor derailments, brake malfunctions and door opening and closing. The MBTA recently appropriated \$10 million to make the LRV's more reliable.

Many other types of light rail vehicles are being produced in Europe and a Canadian LRV is being built to use in Toronto and marketed in the U.S. The Canadian vehicle is sized similar to the PCC. The German DUWAG U-2 has been ordered for use in Edmonton, Canada.

Type of Operation

Light rail vehicles operating on shared surface rights-of-way (street-car mode) can provide a reasonable maximum capacity of about 4,000 passengers per hour. Providing an exclusive guideway (median reservation) on the street will increase the maximum capacity to about 10,000 passengers per hour. Grade separating the right-of-way can increase capacities to 25,000 passengers per hour. Examples of light rail vehicles operating in these different rights-of-way are found locally as shown in Table 7.3. The speeds attained in various rights-of-way or station spacing operations in Boston are shown below.

TABLE 7.3
CHARACTERISTICS OF MBTA LIGHT RAIL LINES

<u>Line</u>	<u>Type of Route</u>	<u>Average Station Spacing</u>	<u>Average Route Speed (MPH)</u>
Arborway	Street Running	600 Ft.	6 - 7
Beacon Street	Median Reservation	800 Ft.	10.0
Mattapan-Ashmont	Grade-Separated	1/3 Mile	12.0
Riverside	Grade-Separated	3/4 Mile	22.5

Source: U. S. DOT "Light Rail Transit" and MBTA data

Table 7.3 indicates that street running light rail vehicles have very low operating speeds in the heavy vehicle traffic found on the Arborway Line. Bringing the lines into a median reservation improves speed characteristics but frequent station stops negate much of this advantage. Exclusive grade-separated rights-of-way produce the highest operating speeds but much of this advantage is diminished if station stops are too frequent. The higher speeds possible with the new LRV are used to best advantage on the River-side Line.

A variety of fare collection methods and equipment are used on light rail transit systems. At lower volume stations, fares are collected by the operator or an attendant while passengers board or leave the vehicle. On-board collections increase station dwell times and therefore reduce overall travel speed. The method also increases operating costs since an attendant must be in every vehicle, even if not required for operations. At high volume stations (such as those in the Central Subway), turnstiles are used, but this system is only cost effective at stations which can justify the presence of an attendant at all times.

In many European cities, a self-service system is used where persons purchase and cancel tickets. On-board spot checks by transit personnel are occasionally made and the penalty for not having a valid ticket is much higher than the fare. This system has been often recommended for use in the U. S. to reduce operating costs and increase travel speeds but has not yet been instituted anywhere in this country.

A nation-wide average unit operating cost for streetcars in 1973 ranged between \$1.65 - \$2.93 per vehicle mile. By comparison, a study of 1974 operating costs on the Beacon Street Line showed that costs ranged between \$4.54 - \$5.05 per mile. The 1976 PMT estimates PCC operating costs to be between \$6 - \$10 per vehicle mile operating cost. Data for Boston's new LRV's are not yet available, but should be released in the near future.

Evaluation

Light rail technology offers the following advantages and disadvantages:

Advantages

1. Technology allows for considerable flexibility of operations, thereby potentially reducing construction costs
2. Less noise and air pollution than buses
3. Greater loading and unloading capacity than buses
4. Reduced manpower compared to bus
5. Can assume characteristics of rapid transit

Disadvantages

1. Higher costs for guideways, equipment and operations than buses and trackless trolleys
2. Lack of flexibility in varying routes to respond to changes in passenger demand
3. Higher operating costs per vehicle mile than rapid transit at high passenger volumes
4. Difficult to pass disabled vehicle

Applicability to Study

Light rail transit can serve as either a feeder to a higher capacity mode such as rapid transit or as a line haul mode. The study area contains alignments where light rail vehicles can be operated on either exclusive rights-of-way (the Midland Branch Railroad) or in median reservations (e.g. Washington Street or Blue Hill Avenue). Connection to the Green Line Central Subway provides downtown distribution service for potential light rail systems.

RAPID TRANSIT

Description

Rapid transit systems operate with heavy rail vehicles in trains of cars on exclusive, grade-separated right-of-way with high platform loading. Rapid transit systems generally function with from two to ten cars and usually get power from a third rail; although an overhead catenary is sometimes used as a power source. Rapid transit systems in Boston include the Orange, Blue and Red Lines.

Rail rapid transit has the greatest fixed facility requirements of all MBTA modes. The third rail and high platform configuration necessitates more extensive vertical access facilities (stairs and escalators) than light rail. The greatest costs are normally incurred in providing complete grade-separation via tunnels, open cuts and embankments, and elevated structures. Grade and alignment requirements are more stringent than light rail.

Fares for rapid transit systems are generally collected before boarding. This increases construction and operating costs in stations, but permits shorter dwell times at each station and faster speeds, and obviates the need for an attendant in each car, thereby reducing overall operating cost for the line. Fares may be paid in cash, tickets, or tokens, by flashing a prepaid pass or season ticket, or by a magnetically-encoded ticket. There is a pronounced worldwide trend toward prepayment, automatic payment, and self service fares, and away from on-board or other manual fare payment.

Operating costs nation-wide averaged about \$1.60 - \$1.80 per vehicle mile in 1973, compared to the systemwide average for MBTA rapid transit of \$4.95 per vehicle mile in 1974.

Evaluation

Major advantages and disadvantages of rapid transit are summarized as follows:

Advantages

1. Provides highest passenger-carrying capacity of any transit mode
2. High overall travel speeds are usually achieved because of complete grade-separation
3. The mode is a potential catalyst for new land use development around stations
4. Has low operating cost per passenger at high passenger volumes

Disadvantages

1. Necessitates very high capital cost requirements to establish right-of-way and stations. This limits closeness of station spacing and practicality of constructing new lines
2. It must run on an exclusive right-of-way with grade crossings virtually impossible
3. Difficult to pass disabled vehicle

Applicability to Study

Rapid transit systems could tie into either the Orange or Red lines. Major alignments which could be considered are the Midland Branch, the Washington Street/Blue Hill Avenue/Warren Street corridor and a cross-town transit corridor between Uphams Corner, Dudley Square and Ruggles Station. The mode should be investigated.

The Midland Branch railroad represents the lowest cost solution for rapid transit, since right-of-way and tracks now exist. On this alignment, signals, electrification, stations (and most likely a third track) would be needed for a rapid transit service. All other potential alignments would require tunnels under city streets at a far higher capital cost.

COMMUTER RAIL

Description

Commuter rail systems are usually associated with longer distance, relatively high-speed passenger transport which brings passengers from suburban areas into the central city. The service uses railroad rights-of-way, on-board fare collection and generally offers limited service frequency. Both low and high platform loading may be used, although only low platform service currently is provided in the Boston area. Passenger coaches are designed to accommodate seated passengers only.

Commuter rail is the oldest of all mass transit modes currently operating in the MBTA district. In the Greater Boston area, all commuter rail track-age and rolling stock is owned by the MBTA and operated by the Boston and Maine under contract to the MBTA. All commuter railroad trains in the Boston area are diesel powered using either diesel locomotives pulling coaches or self-contained diesel-powered coaches (called RDC or "Buddliners"). Nationwide, most commuter lines are diesel powered with the major exceptions of New York, Chicago and Philadelphia where electric power is supplied by either overhead catenary or third-rail. Locomotives which operate under both diesel and electric power are possible and are used in areas such as the New York metropolitan area.

Most commuter rail operations terminate at a single downtown terminal. The high concentration of passengers combined with small number of doors increases station dwell times and headways. If service is frequent, platforms must be provided for several trains to unload simultaneously. Boston's downtown commuter rail terminals are located at North and South Stations.

As shown in Table 7.1, the commuter rail mode could provide a capacity of about 6,000 passengers per track per hour*. This capacity tends to be limited by the relatively unsophisticated control and signal systems currently found on most railroad lines. This lack of sophistication and precision requires that relatively large headways be employed, which results in low capacity. The situation is further aggravated by the higher operation speeds of commuter rail which requires greater headways for safety.

The MBTA has estimated the cost of rehabilitating a Budd Car to be about \$325,000. In 1973, nationwide operating costs for commuter rail systems ranged between \$1.48 - \$4.23 per mile. A study of operating costs for all commuter lines in Boston for the same year was \$3.55 per vehicle mile. Construction and operating costs for commuter rail stations tend to be low because of the low platforms and on-board fare collection.

Fares on commuter rail lines nationwide are significantly higher than other public transportation modes. For example, the minimum current commuter rail fare in Boston is \$1.10 for a trip of up to 8.4 miles and \$1.30 for a trip of up to 12.4 miles (although this will be modified for interim Midland Branch service - see Chapter 3). The ride from Forest Hills to downtown costs \$1.10 on commuter rail and \$.25 on the Orange Line. Higher fares reflect a generally more affluent patronage and the fact that commuter rail services were recently acquired by public agencies from private operators who set fares at levels required to realize a profit from the service.

* By comparison, when commuter rail service from the Franklin Branch, the Providence Main Line and Stoughton Branch is diverted to the Midland Branch, 3,000 passengers will be using the system in the peak hour.

Evaluation

General advantages and disadvantages of commuter rail are as follows:

Advantages

1. Provides moderate carrying capacities over long distances at high rates of speed
2. Provides a comfortable, generally seated ride to passengers
3. Lower initial capital construction costs due to on-board power system, and small on-line stations

Disadvantages

1. Does not function efficiently with frequent station stops because of poor acceleration/deceleration characteristics
2. Provides virtually no downtown distribution
3. Current railroad labor rules tend to inflate operating costs
4. Fares are much higher than other public transportation modes serving Boston
5. Requires exclusive right-of-way

Applicability to Study

The Midland Branch will be upgraded to provide commuter rail service with three new stops in Boston during reconstruction of the relocated Orange Line corridor. Continued use of the trackage for commuter rail service (with more station stops in the study area) to South Station is a possible alternative mode. Although commuter rail stations are normally spaced at least two miles apart (Table 7.1), closer spacing is not uncommon in urban areas. For example the average station spacing on the Needham Branch between Needham Heights and Forest Hills (9 stations) is 1.05 miles; several stations are less than one mile apart. (This compares to 1.2 miles between Dudley and Egleston Stations on the Orange Line.)

The typical commuter rail service characteristics of high fares, no provision for standees and limited frequency of service are not particularly appropriate to study area needs. However, the potential low cost of implementing commuter rail service warrants that the mode be examined further in conjunction with other modes.

OTHER MODES

In this section, transportation modes not currently found in the MBTA system are discussed in terms of their applicability to service the transportation needs of study area residents.

The MBTA's policy on new technology is summarized in the 1976 PMT as follows:

"The MBTA will exercise particular caution in design specifications for technological improvements in new or modernized vehicles or in other new machinery. Any such improvement shall generally be of proven technology and maintainability. Any device which utilizes a technology which has not given proven results in regular service will require in-service testing by the Authority over a sufficient period on a prototype basis before extensive use of the device is committed."

Personal Rapid Transit

A "pure" Personal Rapid Transit (PRT) System consists of small vehicles which transport passengers non-stop from origin to destination on a network of exclusive right-of-way guideways. Stations are off-line so that passenger loading and unloading does not slow down or interfere with traffic on the main line. A PRT system is automatically controlled (no driver) employing a computer. Currently, no "pure" PRT systems are in operation.

A small number of "modified" PRT systems employing larger vehicles and accommodating larger number of passengers at the expense of non-stop individual service are now in operation. Nearly all modified PRT systems in operation today are at airports (Tampa, Dallas/Ft. Worth, Seattle/Tacoma, etc.). A notable exception is the Morgantown PRT System which provides service between Morgantown, West Virginia and the West Virginia University campus, a distance of approximately five miles. All systems function with small rubber tired vehicles on fixed guideways. Recently, the Urban Mass Transportation Administration awarded funds for PRT demonstration projects in Los Angeles, Houston, Cleveland and St. Paul.

At this time, the possible application of PRT technology to the study area appears to be quite limited. A primary problem is its lack of capacity relative to its cost. The Morgantown system has a capacity of about 3,000 passengers per hour at a cost far higher than modes with comparable capacity. A PRT system would have to be completely grade-separated, requiring either an elevated structure or expensive underground construction. Finally, a PRT system would not be able to tie in with any existing MBTA system.

Dual-Mode Vehicles

Dual-mode transportation is that broad category of systems wherein vehicles may be operated in both of two modes: (a) manually controlled and self-propelled on ordinary streets and roadways, and (b) automatically controlled or externally propelled (or both) or powered on special guideways. In general, dual-mode transportation systems can include both common carrier and private vehicles and provide for the transport of both persons and freight over a common guideway facility.

Dual-mode transit is a special case of dual-mode transportation. Service is provided only by common-carrier vehicles for passenger transportation. Such service may be on a personalized or group transit basis.

This concept has been discussed and studied for at least two decades, but has not been implemented anywhere. It is unrealistic to consider this concept as a viable alternative to other modes (buses, light rail, rapid transit and commuter rail) which have proven to be practical through years of testing by the general public.

Monorail

The use of the monorail as an urban transportation mode has been limited in this country (Disneyland and Seattle, Wash.), although it is found more frequently in Japan. Monorail has some serious disadvantages over fixed rail modes such as:

1. The tendency to sway introduces problems of passenger comfort and safety, and requires greater clearance between parallel tracks, in tunnel sections and at platform
2. Switching is a major problem, since large beam sections have to be moved rather than relatively small conventional rail track system
3. Higher initial capital cost than conventional two-track rail system
4. Monorail normally requires an elevated structure which presents aesthetic and noise problems which are contrary to expressed community goals
5. Lack of standardization

For these reasons, monorail was not given further consideration as a transit mode for the study area.

IMPROVING TRANSIT VEHICLE OPERATION IN STREETS

The speed, capacity and performance of transit vehicles on surface streets can be increased significantly by "Transportation System Management" (TSM) programs that give preferential treatment to high capacity vehicles. Two basic methods of improved traffic management are preferential lanes and traffic engineering improvements.

Preferential Lanes

Lanes marked as exclusive for transit vehicles ("diamond lanes") are often used to expedite transit trips. Curb bus lanes in the normal direction of flow are the most common. They have been instituted in more than 20 cities in the United States and Canada (e.g., Baltimore, New York City, San Francisco, and Washington, D.C.) and in a number of European cities. These lanes are usually in effect during peak periods, although some operate continuously. They require only small capital costs to implement and are very effective when kept clear of other vehicles. Right turning vehicles often are allowed to use the bus lane but in some cases right turns are prohibited. A potential major disadvantage is the requirement to eliminate on-street parking during the hours these lanes are in operation.

Contra-flow bus lanes in which buses operate opposite to normal traffic flow have been instituted in an increasing number of cities throughout the U.S. and Europe. Contra-flow bus lanes operate on one-way streets, usually throughout the day. Buses using the lanes are separated from other traffic flow, and therefore are not affected by peak-hour congestion at signalized intersections.

The lanes may complicate loading and access to adjoining properties. They increase left-turn conflicts with opposing traffic. On one-way streets with frequent signals, buses may have to operate against the signal progression.

Contra-flow lanes can be implemented at low cost and often produce significant improvements. For example, Louisville, Kentucky's Second-Third Street contra-flow bus lanes reduced bus travel times by about 25 per cent.

A more permanent separation can be achieved by constructing a reservation for transit vehicles, usually in the center of the street. Examples of median bus lanes are found in Chicago (Washington Street), Philadelphia (Market Street) and New Orleans (Canal Street). These lanes are in effect throughout the day. They are removed from traffic conflicts along the curb, and allow other traffic to make right turns without conflicting with buses. Median reservations for light rail systems are common, particularly in Boston.

Median reservations require wide streets with provisions for service stops and pedestrian refuge in the median. Passengers are required to cross active traffic lanes to reach bus stops. Left turns must be controlled and sometimes prohibited to minimize interference with transit vehicles (see Appendix F for a more detailed analysis of median bus lanes).

Examples of exclusive bus lanes in the United States and Puerto Rico are given in Table 7.4.

Traffic Engineering Improvements

Transit efficiency can be improved by instituting transit related traffic engineering improvements. Examples of such improvements are:

- Traffic signal improvements, such as system coordination, modernization and pre-emptions or overrides for buses and trolleys
- Intersection improvements
- Lengthening or relocation of transit stops
- Improved spacing of transit stops
- Extension of parking regulations

Preferential treatment at traffic signals for high occupancy vehicles such as buses, trackless trolley and light rail vehicles can be a useful tool as part of an overall transportation strategy. It is estimated that average travel speeds can be increased by 10 per cent. An example

TABLE 7.4
EXCLUSIVE BUS LANES IN THE UNITED STATES AND PUERTO RICO

<u>City and Location</u>	<u>Date Started or Status</u>	<u>Length (Miles)</u>	<u>Hours of Operation</u> ¹	<u>Peak-Hour Bus Volumes</u>
<u>Curb</u>				
Chicago, Il. Cermak Road-47th Avenue Turnaround	Existing	0.03	24	12
New York, N.Y. Hillside Avenue, Queens between Francis Lewis Boulevard and 167th Street	1969	2.0	7-9 a.m. 4-7 p.m.	170
Livingston Street, Brooklyn, between Flatbush Avenue and Boerum Place	1963	0.68	7-9 a.m. 4-7 p.m.	.77
Victory Boulevard, Staten Island between Bay Street and Forest Avenue	1963	1.0	7-9 a.m. 4-7 p.m.	64
<u>Contra-Flow Bus Lane</u>				
Chicago, Il. North Sheridan Road	1939	1.25	7-9:30 a.m. 4-6:30 p.m.	32
Indianapolis, In.	1965	2.75	24	10
Louisville, Ky. Third Street between Breckenridge and Avery	1971	1.50	7-9 a.m.	12 ²
Madison, Wi. University Avenue	1966	2.0	24	15
San Juan, P.R. (1) Ponce de Leon, (2) Fernandez Juncos, and (3) Munoz Rivera Avenues	1971	10.8	24	NA
Miami, Fl. South Dixie Highway	1974 demonstration	5.5	7-9 a.m. 4-6 p.m.	NA
<u>Median Bus Lane</u>				
Atlanta, Ga. Walton Street between Broad and Forsythe Streets	1958	.08	7-9 a.m. 4-6:30 p.m.	30
Chicago, Il. Washington Street between Wacker Drive and Michigan Avenue	1956	0.60	24	108
State Street between Wacker Drive and Congress Street	1958	0.60	24	
New Orleans, La. Canal Street. Neutral ground between Mississippi River and North Claiborne St.	1966	1.25	24	55
Philadelphia, Pa. East Market Street between Sixth and Broad Streets	1956	0.65	24	120

¹ Hours of lane operation; hours of bus operation may vary

² Express bus volume.

Source: U.S. D.O.T. - Transportation System Management - State of the Art, February, 1977

of this is the new computerized traffic control system on Massachusetts Avenue in Boston which senses the movement of buses on Massachusetts Avenue and then adjusts the timing of signals to accelerate traffic flow in approaches occupied by buses. In Commonwealth Avenue's new traffic improvement plan, light rail vehicles operating in a median reservation will receive priority at intersections.

TRANSIT COSTS

Capital Costs

In order to compare the cost of transit alternatives without performing detailed engineering design, data were developed from various sources to determine the cost per mile of implementing various transit modes on differing alignments. Unit costs for the various modes are given in Table 7.5 broken down by each cost component. Table 7.6 shows these costs aggregated on a per mile and per station basis for various right-of-way configurations. Table 7.6 clearly shows the large increase in costs when tunnels, constructed by either cut and cover or deep bore (shield-driven) methods, are required to provide transit right-of-way.

**TABLE 7.5
COMPARATIVE UNIT CAPITAL COSTS (1977)**

	COST PER MILE				
	Commuter Rail	Rapid Transit	Light Rail	Trackless Trolley	Bus
<u>Guideways</u>					
Deep Bore	\$63,000,000	\$63,000,000	\$63,000,000	-----	-----
Cut & Cover	\$33,500,000	\$33,500,000	\$33,500,000	-----	-----
At-Grade	\$ 1,400,000	\$ 1,400,000	\$ 900,000	\$ 500,000	\$500,000
<u>Trackwork</u>	\$ 1,200,000	\$ 1,200,000	\$ 1,200,000	-----	-----
<u>Traction Power</u>					
Third Rail	-----	\$ 1,000,000	-----	-----	-----
Overhead Wire	-----	-----	\$ 1,400,000	\$ 1,500,000	-----
<u>Signals and Communication</u>	\$ 300,000	\$ 1,600,000	\$ 500,000	-----	-----
<u>Transit Priority Signals</u>	-----	-----	\$ 250,000	\$ 250,000	\$250,000
<u>Engineering and Administration</u>	15% of non-vehicle capital costs				
<u>Contingencies</u>	25% of non-vehicle capital costs				
<u>Vehicles (each)</u>	\$ 750,000	\$ 600,000	\$ 650,000	\$ 105,000	\$ 75,000

Sources:

1. Costs for Guideways for Deep Bore and Cut & Cover taken from recent construction estimates (Spring 1977) of Red Line Extension from Harvard Square to Alewife Station
2. Costs for Trackwork, Traction Power, Signals and Communication taken from estimates prepared by T. K. Dyer (Light Rail Transit - DOT UT 50009 Spring 1976)
3. Source for vehicle costs taken from 1976 - PMT and 1977 UMTA grants for MBTA and other U.S transit authorities.
4. Source for transit priority signals - TAMS experience on Commonwealth Avenue & Massachusetts Avenue

TABLE 7.6
UNIT CONSTRUCTION COSTS (1977)

	COST PER MILE				
	Commuter Rail	Rapid Transit	Light Rail	Trackless Trolley	Bus
Deep Bore Tunnel	\$96,000,000	\$96,000,000	\$96,000,000	\$96,000,000	-----
Cut & Cover Tunnel	\$54,000,000	\$54,000,000	\$54,000,000	\$54,000,000	-----
At-Grade (on street)	-----	-----	\$ 6,100,000	\$ 3,200,000	\$ 1,100,000
On Midland Branch	\$ 1,800,000	\$ 5,800,000	\$ 4,600,000	-----	-----

	COST PER STATION				
	Commuter Rail	Rapid Transit	Light Rail	Trackless Trolley	Bus
Underground	\$21,000,000	\$21,000,000	\$16,000,000 *	-----	-----
Embankment/Open Cut	\$ 500,000	\$ 3,200,000	\$ 500,000	-----	-----
At-Grade (on street)	-----	-----	\$ 100,000	\$ 100,000 (per mile)	\$ 100,000 (per mile)

* Lower cost due to shorter train length for light rail

1. All costs include 15% for engineering and administration and 25% for contingencies
2. Cost per mile includes everything except costs for stations and rolling stock
3. Costs for underground construction and stations taken from Spring 1977 construction estimates for Red Line Extension. Costs for embankment/open cut taken from station estimates for the relocated Orange Line. Costs factored for light rail and commuter rail stations
4. At-grade (on-street) assumes exclusive median reservation with traffic priority at intersections
5. Costs for Midland Branch include electric power, signals and communications, and a third track for freight (from Blue Hill Ave. to Norfolk Street). Third track costs were taken from estimates prepared by T. K. Dyer, "Reconstruction of the Dorchester Branch", February, 1977. Costs for upgrading the existing trackage are not included.

Operating Costs

Projected operating costs for all alternatives were calculated from a set of formulas derived by the Executive Office of Transportation and Construction (EOTC) reflecting 1975 costs for all MBTA operated modes. The cost formulas measured the costs associated with the implementation of each alternative without apportioning systemwide costs of existing MBTA facilities. Based on recent data, inflation factors (varying from 8 to 13 per cent) were applied to the initial estimates to reflect a 1977 cost structure. In addition, projected feeder bus service and cost changes associated with each alternative were assessed and included in developing operating costs.

Comparative Costs

Figure 7.1 shows a general relationship between passenger-carrying capacity and annual system cost for bus, light rail (LRV) and rapid transit (subway)*.

At low passenger volumes, the bus is most economical because of low capital costs for both vehicles and right-of-way (which generally is

* Source: Lenow, Martin, "The Resurgence of Light Rail Transit", Transportation Engineering Journal of ASCE, May, 1976

an existing street). When volumes increase, the bus becomes less economical because smaller vehicles make the ratio of driver cost to passenger capacity quite high. (Note: this is somewhat alleviated when articulated buses are used). Rapid transit, on the other hand, has high per passenger cost at low volumes because of very high capital and power costs. However, at high volumes, cost per passenger is low because of a very low ratio of labor cost to passengers carried, particularly when 6-8 car trains are used. As Figure 7.1 shows, light rail is most economical in an intermediate range of passengers since light rail has characteristics which range between the two extremes.

Note that this is a generalized figure and does not show specific passenger capacity points where light rail becomes more economical than buses and where rapid transit becomes more economical than light rail. These points depend upon such factors as operator's salaries and fringe benefits, labor work rules, type of right-of-way and power costs.

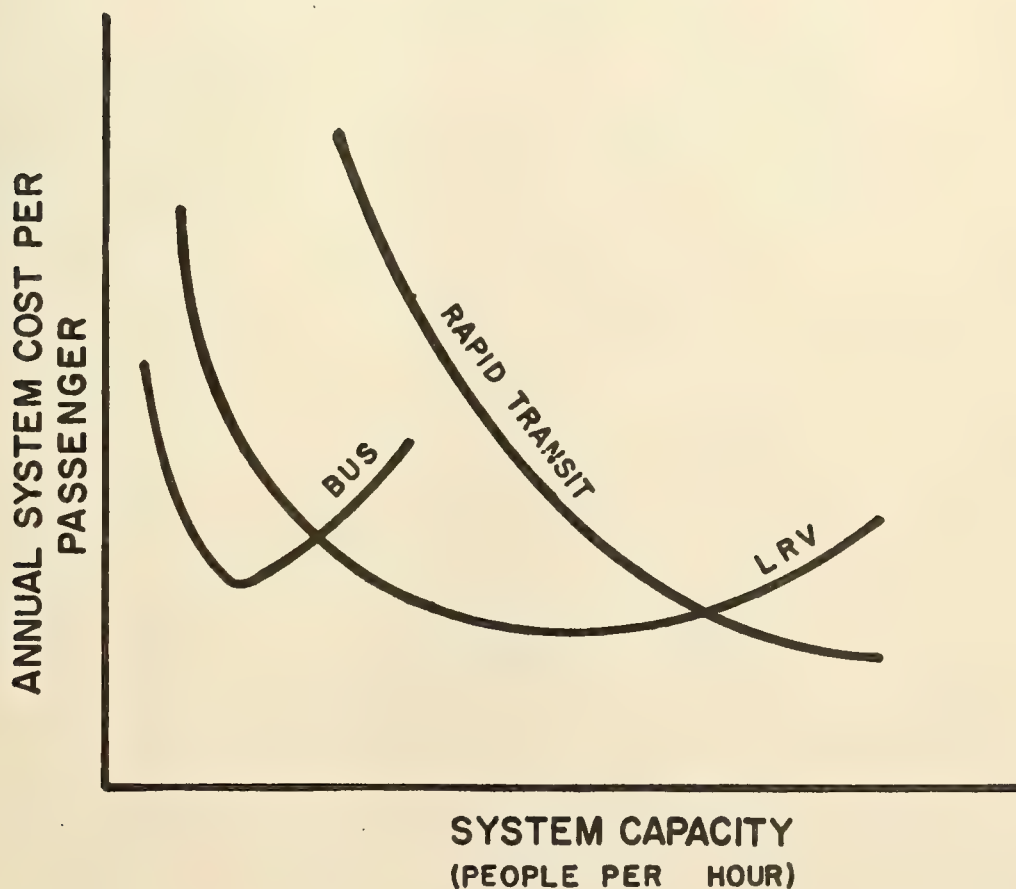


FIGURE 7.1
COST VS CAPACITY, FOR VARIOUS MODES

**replacement/transit
improvement study**

**SOUTH END
DORCHESTER**

**ROXBURY
MATTAPAN**

8

Right-of-way Analysis

CHAPTER 8 RIGHT-OF-WAY ANALYSIS

INTRODUCTION

The purpose of the right-of-way (R.O.W.) analysis was twofold: (1) to inventory potential rights-of-way to help identify fixed-route transit alignments, and (2) to analyze the impacts of these transit alignments on the rights-of-way identified.

The process initially involved collecting data on alignments having potential transit use. These data, in conjunction with transportation demand factors and potential connections to existing services, were used to identify potential transit alignments. Then the required transit rights-of-way were superimposed upon the existing alignments to determine potential right-of-way problems.

The sketch plan level of analysis used in Phase I for selecting transit alternatives has served mainly to indicate potential problems which must be resolved in Phase II of the study when a fewer number of alignments will be analyzed in greater detail.

R.O.W. IDENTIFICATION AND STREET INVENTORY

Potential alignments for transit use in the study area are effectively limited to city streets and the Midland Branch Railroad. Initially a number of major streets were identified as having the greatest potential for transit service based on the following criteria:

1. Providing connection between commercial centers in the study area
2. Having greatest R.O.W. width
3. Providing potential tie-in or transfer to existing transit services
4. Having adjacent land uses most compatible with transit service
5. Providing potential connection between the Midland Branch and Washington/Warren/Blue Hill Corridors

Schematic diagrams showing cross-sections and other data collected on the streets listed in Table 8.1 are included in Appendix D.

MIDLAND BRANCH RAILROAD

Existing Condition and Upgrading for Temporary Railroad Service

The Midland or Dorchester Branch Railroad runs from the Shoreline RR at Readville to South Station. A two-track railbed runs for eight miles

TABLE 8.1
STREETS INVENTORIED FOR RIGHT-OF-WAY ANALYSIS

Figure No.

<u>(Appendix D)</u>	<u>Street</u>	<u>From</u>	<u>To</u>
D-1	Blue Hill Avenue *	Dudley Street	Mattapan Square
D-2	Washington Street *	Kneeland Street	Forest Hills
D-3	Warren Street *	Dudley Station	Grove Hall
D-4	Dudley Street *	Uphams Corner	Dudley Station
D-5	New Dudley Street*	Dudley Station	Tremont Street
D-6	Ruggles Street *	Washington Street	Huntington Avenue
D-7	Washington Street* (Dorchester)	Grove Hall	Codman Square
D-8	Talbot Avenue *	Blue Hill Avenue	Dorchester Avenue
D-9	Columbia Road *	S. E. Expressway	Grove Hall
D-10	Seaver Street/ Columbus Avenue *	Jackson Square	Blue Hill Avenue
D-11	Martin Luther King Boulevard *	Warren Street	Washington Street
D-12	Morton Street	Forest Hills	Washington Street
D-13	Norfolk Avenue	Cottage Street	Washington Street
D-14	Geneva Avenue	Grove Hall	MBTA Red Line
D-15	Tremont Street	Mass. Turnpike	Roxbury Crossing
D-16	Shawmut Avenue	Mass. Turnpike	Dudley Station
D-17	Harrison Avenue	Mass. Turnpike	Dudley Station
D-18	Proposed Crosstown St.	S. E. Expressway	Columbia Avenue
D-19	Massachusetts Avenue	Mainline RR	Columbia Road

* Includes field survey in field in addition to data collection from published source and photogrammetric maps.

between Readville and the rail yards at South Bay. Along the six miles in the study area between Mattapan Square and South Bay, there are 14 track bridges, 10 highway bridges and one grade crossing at Bird Street.

The "Preliminary Design Report for the Reconstruction of Dorchester (Midland) Branch", by Thomas K. Dyer, Inc. (February, 1977) was concerned primarily with the costs of reconstructing the railbed to provide a detour for commuter and intercity passenger rail service during construction of the re-located Orange Line.

According to the Dyer Report, inspections were made of each track bridge. The inspections disclosed that considerable corrosion of various bridge components has occurred over the years. However, according to a structural analysis of selected bridges as well as a review of railroad standards and ratings, the damage from corrosion caused no capacity concerns

for operating passenger service along the Midland. According to the Massachusetts Department of Public Works there are no structural concerns for the highway bridges.

The present signal systems along the Midland are either designed for single track freight or are antiquated. In either case the signaling is outdated for passenger train, light rail or rapid transit service.

Currently there is only local freight service on the line. The South Station - South Bay yards are used for storing Amtrak passenger trains and ConRail utilizes portions of the Branch for switching movements at the Boston Freight Terminal, South Bay and Beacon Park.

At the present time there is no regular passenger service on the Branch, and there has not been any for many years. When the construction work for the Relocated Orange Line begins, passenger service will be detoured from the Shore Line, consisting of 48 commuter and 18 Amtrak trains each weekday. There will be 33 inbound and 33 outbound trains.

Improvements during reconstruction of the line for interim service include fencing, installation of new welded rail, installation of new wayside signals with cab signalling, elimination of the grade-crossing at Bird Street and provision for temporary stops at Uphams Corner, Morton Street and Fairmount (Hyde Park).

Potential Addition of a Third Track

Included in the Dyer report was an analysis of the feasibility and cost to reconstruct the right-of-way in order to accommodate three tracks for future use. This would allow two tracks to be used for either light rail or rapid transit service, with the third track used for freight and/or passenger railroad service.

The analysis considered only the section of tracks from Norfolk Avenue to Blue Hill Avenue. The remainder of the railbed north of Norfolk Avenue was not included in the cost estimate due to some design uncertainties which could not be resolved during the course of the brief analysis.

Providing an additional track on Norfolk Avenue - Blue Hill Avenue portion will require (above and beyond that already necessary to upgrade the Midland for passenger service) excavation, embankment fill, retaining walls, added track and highway bridge spans with abutment changes, alterations to existing signals and pole and wire line, and relocation of fencing.

To provide for a 3rd track, the railbed would have to be widened in certain areas, although many areas are already graded for three tracks. Minor land takings would be required between Bird Street and Quincy Street, Columbia Road and Geneva Street and at Norfolk Street.

In addition to excavation and embankment work, eight existing track bridges would require the addition of another span. Further construction will be required at six projected station locations:

1. Uphams Corner at Dudley Street
2. Quincy Street - Columbia Road
3. Mount Bowdoin at Washington Street
4. Harvard Street
5. Morton Street
6. Blue Hill Avenue (Mattapan Square)

The Dyer Report estimated costs for both high and low platform systems as shown in Table 8.2. These costs include provision of a 3rd track, either overhead catenary or 3rd rail service and provision of platforms at stations. Only the section between Norfolk Avenue and Blue Hill Avenue is included.

TABLE 8.2
ESTIMATED COST TO PROVIDE FOR TRANSIT ON MIDLAND RAILROAD

<u>Construction Cost in 1976 Dollars</u>		
	Light Rail Type Low Level Platforms (Catenary)	Rapid Transit Type High Level Platforms (Third Rail)
Right-of-Way	\$6,500,000	\$7,600,000
Stations	<u>1,200,000</u>	<u>2,800,000</u>
Total	\$7,700,000	\$10,400,000

* Source: T, K. Dyer - "Preliminary Design Report for Reconstruction of the Dorchester (Midland) Branch", February, 1977

RIGHT-OF-WAY REQUIREMENTS

Most of the Phase I right-of-way analysis was concerned with either light rail, bus or trackless trolley vehicles operating in a median reservation on city streets. Such systems require that space be allocated for both transit service and normal vehicular traffic and possibly parking. Tunnels also require sufficient right-of-way to minimize underpinning of adjacent structures. While detailed vertical alignment and geotechnical data would be required to precisely define this width requirement, a rule-of-thumb measure would be a 60-foot right-of-way for a two track tunnel. Since this width is available on virtually all potential transit alignments in the study area, potential tunnel right-of-way problems were not analyzed further in Phase I.

Median Reservation for Light Rail and Bus

Standards for light rail median reservations were obtained from plans for a reconstructed Commonwealth Avenue. Three configurations are possible for a light rail system operating in a median:

No platforms:	25-26' wide
Platforms on one side:	31-32' wide
Platforms on both sides:	35-36' wide

Having two stations directly opposite each other (i.e., platforms on both sides) is wasteful in terms of width and undesirable for vehicular traffic operations. Consequently it is advisable to stagger platforms and a 32-foot required width for light rail medians was carried through as a standard to use in determining right-of-way suitability.

Based on information from the technical literature and traffic operations, the following minimum cross-section was derived for buses:

Two travel lanes @ 11'	=	22'
One platform @ 5'	=	5'
Two curbs @ 2'	=	4'
Total		31'

Since this is close to the light rail width, a standard width of 32 feet was carried through in all subsequent analyses.

Evaluation of Street Width Adequacy

Once the median width was established, a total standard cross-section was developed. The standard width included the following elements as shown in Figure 8.1.

Transit median	32'	
Two travel lanes @ 12'	24'	(or four travel lanes @ 11')
Two parking lanes @ 10'	20'	
Two sidewalks @ 7'	14'	
Total	90'	

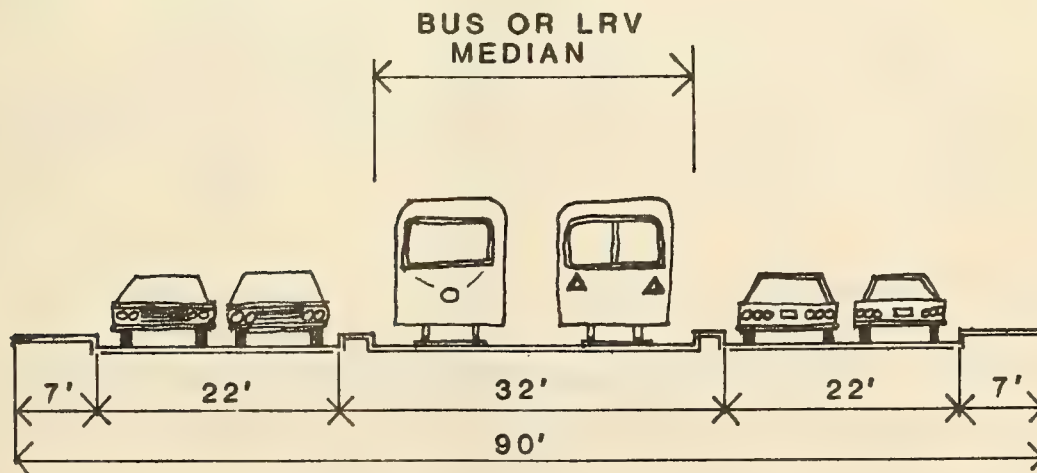


FIGURE 8.1

MINIMUM STANDARD STREET CROSS-SECTION

This minimum standard of 90 feet was used to identify potential right-of-way problem areas for transit alignments. Obviously the 90 feet can vary considerably from street to street depending on traffic volumes, vehicle turning movements, parking requirements and pedestrian requirements. These will be identified more precisely in Phase II.

Based on the 90-foot requirement, right-of-way deficiencies were identified for all the streets utilized as part of alternative transit systems. These segments are shown in Figure 8.2.

Five solutions are possible to overcome these deficiencies:

- (1) build tunnel sections
- (2) acquire property along the right-of-way
- (3) run light rail or bus on street with other vehicles
- (4) prohibit or severely restrict vehicular traffic on portions of the street
- (5) prohibit parking along sections of the route

Building tunnel sections would probably obviate the need for any of the other solutions, but is by far the most expensive way to solve the problem. Property acquisition would cost less, but could cause undesirable relocation of businesses and homes and possibly have a damaging affect on neighborhood cohesion. The extent of such impact varies significantly throughout the area since some streets with potential takings (e.g., Blue Hill Avenue north of Grove Hall) contain a very high proportion of vacant land and abandoned buildings along the right-of-way. The field survey given in Appendix D identifies general land use characteristics which will aid in making an assessment of the viability of land takings. A more detailed evaluation will be made as part of Phase II work.

The third solution would lead to very poor transit performance characteristics and increase traffic congestion. The fourth solution might be effective in limited areas such as Dudley Station but probably could not be considered as a general solution along major traffic arterials. Parking prohibitions might be possible but are difficult to enforce and are potentially damaging to commercial properties if sufficient replacement parking is not provided. These factors will be analyzed as part of Phase II.

SPECIFIC ANALYSES

As explained previously, an evaluation of solutions to specific right-of-way problems will be made when the number of transit alternatives is reduced prior to Phase II analysis. However, two specific right-of-way problems are discussed here, since they are part of a number of transit alternatives which will be carried into Phase II. One is the

POTENTIAL RIGHT-OF-WAY DEFICIENCIES

Streets Having Greater
Than Standard 90'
Right-of-Way.

Additional Width
Required to Attain
90' Standard

DUDLEY STATION
AREA (SEE TEXT)

MIDLAND BRANCH RR.
(MINOR LAND TAKING
FOR 3RD TRACK)

SOUTH COVE AREA (SEE FIG. 8.3)

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FIGURE 8.2

alignment in the South Cove area from Washington Street south of the Massachusetts Turnpike tying into the abandoned Broadway Portal of the Green Line Central Subway. The other concerns alignments for light rail or busway in the Dudley Station area.

South Cove Alignment

A light rail system tying into the Green Line at the Broadway Portal is an essential component of transit alternatives 1, 2, 3, 4, 5 and 7 (see Chapter 9). Some potential alignments for this segment had previously been suggested as part of the Boston Transportation Planning Review (BTPR).

Four possible alignments (Figure 8.3) were analyzed as part of the R/TIS. Alignments which were developed during the BTPR called for keeping the light rail line in tunnel from the Broadway Portal until it joined Washington Street at Monsignor Reynolds Way in the South End. This tunnel was costly since it had to pass under the South Cove tunnel of the Relocated Orange Line which, in turn, had to pass under the depressed section of the Massachusetts Turnpike.

Alignment B, also presented in the BTPR report, called for bringing the light rail line to grade on Shawmut Avenue as soon as possible so that it could cross over the Massachusetts Turnpike. This solution had met with community opposition because residents of Bay Village were concerned that it would prove a safety hazard to children walking to the recently constructed Quincy School.

Because of the problems with Alignments A and B, other alignment alternatives were investigated as part of the Replacement/Transit Improvement Study. Alignment C continues in the Green Line tunnel until Marginal Road where it runs parallel to the Massachusetts Turnpike and meets grade just west of Washington Street. It then runs on a new bridge across the Massachusetts Turnpike.

Two alignments running east of the Quincy School were examined. Alignment D-1 runs east from Tremont Street to Washington Street north of the Don Bosco School. The line comes to grade in this segment and then continues down Washington Street in a reservation located at either the center of the street or at its western edge. Alignment D-2, which was not examined in detail, crosses Washington Street at-grade and then runs down the current Orange Line elevated alignment to a point south of the Massachusetts Turnpike.

Table 8.3 indicates the results of the analysis in terms of construction cost and other factors for evaluation.

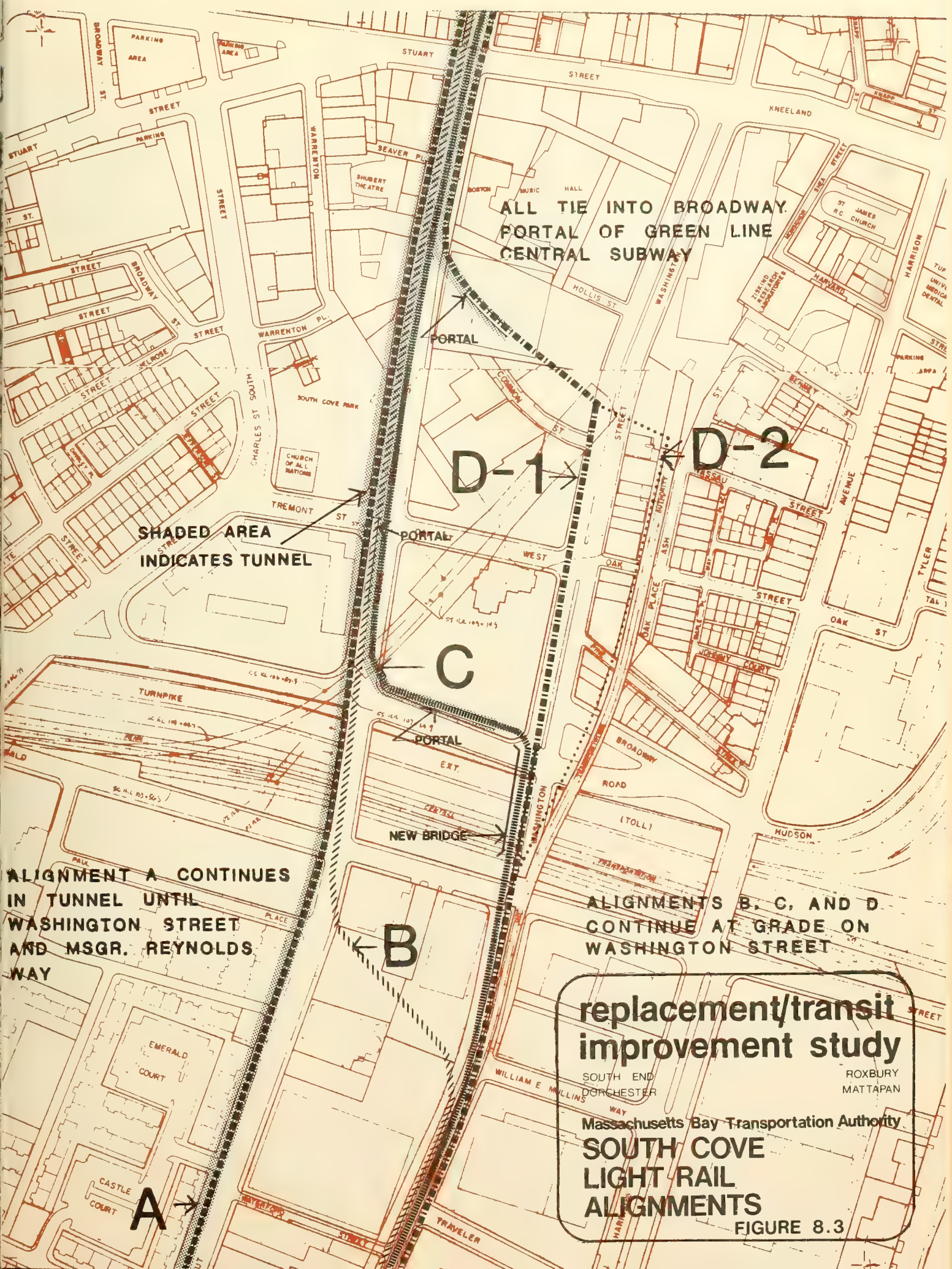
TABLE 8.3
COMPARISON OF SOUTH COVE ALIGNMENTS

<u>Alignment</u>	1977 Construction Cost in \$ Millions	<u>Comments</u>
A	55.5	<ol style="list-style-type: none"> 1. Least disruption to street and pedestrian movements. Least noise impact 2. Tunnel limits practical number of station locations (because of cost) in South End.
B	4.8	<ol style="list-style-type: none"> 1. Major disruption to traffic on Tremont St. and Shawmut Ave. 2. Hinders access to Quincy School from Bay Village
C	8.0	<ol style="list-style-type: none"> 1. Disrupts traffic on Marginal Road (which has lower traffic volumes than the other streets in the area). 2. Does not isolate Quincy School.
D-1	3.7	<ol style="list-style-type: none"> 1. Disruption of traffic on Washington Street 2. Hinders access to Quincy School from Chinatown 3. Potential noise impact on Quincy School.

No definite recommendations were made concerning the comparison of alignments since these are more properly done as part of Phase II. However, alternative C appears to be the most acceptable in terms of cost and community impact. The cost estimate for alternative C was carried through in capital cost estimates for all transit alternatives connecting to the Green Line at Boylston Station.

Dudley Station Area

Service to Dudley Station is an integral part of every transit alternative (see Chapter 9). However, the right-of-way is limited along all potential streets in the vicinity of the Station since Washington and Warren Streets have 60 and 70 foot rights-of-way respectively (less than the minimum of 90 feet).



Detailed analysis of how to solve right-of-way problems in the Dudley area will be made as part of Phase II of this study. During Phase I, the analysis made as part of the BTPR study for a light rail system was reviewed.

The BTPR Southwest report (Figures III-37 and III-38) indicated two potential ways of dealing with the problem. One solution was to have two one-way transit reservations. Going north along Warren Street, service would split at Dudley Street with a northbound reservation along Harrison Avenue and a southbound system along the Washington Street-Warren Street alignment. Both lines would meet again at the proposed Crosstown Street and run as a two-way median up Washington Street. This alignment could probably be built with little or no land takings.

A more extensive alternative studied in the BTPR called for a two-way light rail line running down Washington and Warren Streets. This system would be an integral part of an auto and bus prohibited zone along both Warren and Washington Streets between Dudley and the new Crosstown Street making access to the fronts of stores in the Dudley commercial district possible by pedestrians and light rail only. Auto and truck access would be provided from Shawmut and Harrison Streets with new parking lots constructed at various points.

In Phase II, careful study of the BTPR schemes plus additional alternative alignments are expected to be made by a task force looking at both transportation and land use factors in the Dudley Station area.

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9

Transit Alternatives Analysis

CHAPTER 9 TRANSIT ALTERNATIVES ANALYSIS

INTRODUCTION

This Chapter describes the process used in identifying and analyzing transit alternatives. The analysis of longer range improvements involving construction and vehicle purchase are included in this Chapter. Short-range operational analysis is included in Chapter 6. Information developed in this Chapter is then used in Chapter 10 to determine which alternatives should be given more detailed analysis in Phase II of the study.

Potential public transportation improvements fall into a wide range of possibilities depending on choice of mode, alignment and connections to existing service. Table 9.1 lists possibilities in these three categories developed from the technology, right-of-way and service analyses described in previous Chapters.

TABLE 9.1
POTENTIAL TRANSIT ALTERNATIVES

<u>Mode</u>	<u>Potential Connections</u>	<u>Potential Alignments</u>
Rapid Transit	Orange Line Red Line	City Streets: Tunnel Midland RR: Grade-separated
Commuter Rail	South Station	Midland RR: Grade-separated
Light Rail	Green Line Central Subway Green Line - Arborway Ashmont - Mattapan Line	City streets: At-grade or tunnel Midland RR: Grade-separated
Bus or Trackless Trolley	Proposed Auto Restricted Zone (A.R.Z.) Rail Transit Stations	City streets: At-grade

Since a number of city streets can provide potential transit alignments and various modes and alignments can be combined, the number of possible alternatives is virtually infinite. Delineating, analyzing and evaluating all (or even a large portion of them) early in the study would have been confusing to all concerned. To make the process as simple and as logical as possible, it was imperative to limit the number of alternatives being compared at any given time.

PROCESS

The process for alternatives analysis that was followed is shown schematically in Figure 9.1. Initially, three alignments were identified on the basis of area travel needs and available right-of-way. Then a variety of transportation modes were examined on the three alignments, creating a series of "generalized alternatives". These generalized alternatives specified a particular vehicle type running at a given profile on the alignment but did not contain detailed information such as the location of stations and connection to existing services.

Analysis of the generalized alternatives using the evaluation criteria shown in Table 1.1 provided information required to delineate specific alternatives. The specific alternatives were transit systems at the level of detail required to estimate potential riders attracted to the system, potential travel time savings associated with the system, and transit operating costs. Information about these characteristics and others, such as community response and other evaluation criteria, was generated for each specific transit alternative. This permitted a comprehensive look at the alternatives which were measured by the criteria.

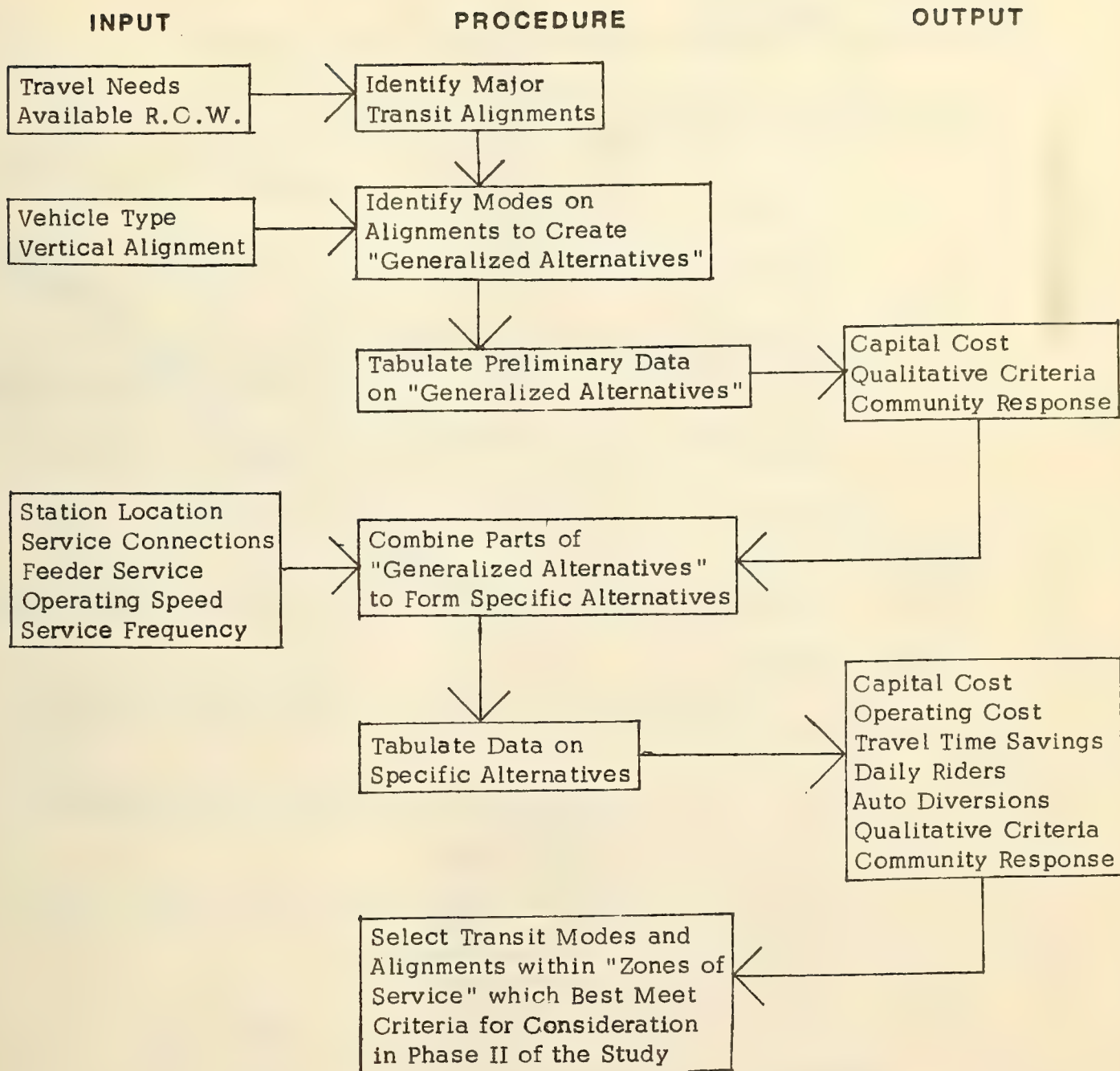
Various transit modes and alignments used as part or all of the specific alternatives were then evaluated on a study area-wide basis and within specified "zones of service" which correspond to the four basic areas of the study.

- Zone 1. South End to Dudley Station
- Zone 2. Dudley Station to Grove Hall
- Zone 3. Grove Hall to Mattapan
- Zone 4. Crosstown (Northeastern to Columbia Point)

The proposed alternatives were compared to two base case alternatives:

1. The Existing Transit System (with the Washington St. Elevated) and
2. The Relocated Orange Line (with a modified Feeder Bus System)

In all cases, proposed improvements were compared to Base Case 2 since relocation of the Orange Line was a premise upon which the study was initiated. Base Case 1 was used only for calibration of the Ridership Model (see Appendix C).



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PROCESS FOR ALTERNATIVES ANALYSIS

FIGURE 9.1

IDENTIFICATION OF GENERALIZED ALTERNATIVES

Major alignments were identified by using information derived from the right-of-way analysis (Chapter 8), the analysis of travel desires (Chapter 4) and examination of alternatives proposed in previous studies including:

- (1) The Boston Transportation Planning Review (BTPR) Southwest Report - 1972
- (2) A Supplementary Report prepared by the BTPR staff (unpublished) - 1973
- (3) A Preliminary Analysis of New TDP (Transit Development Program) Proposals prepared by the Central Transportation Planning Staff (CTPS), June, 1975
- (4) The Program for Mass Transportation (PMT) prepared by the Executive Office of Transportation & Construction - 1976

The three generalized rights-of-way are shown in Figure 9.2. Both Alignment A (Washington Street - Warren Street - Blue Hill Avenue), and Alignment B (The Midland Branch Railroad) are downtown oriented while Alignment C provides a crosstown connection through the Dudley Street area.

Alternative Modes

Fifteen possible fixed-route transportation modes were examined on these alignments:

ALIGNMENT A (Washington Street - Warren Street - Blue Hill Avenue)

1. Rapid transit in tunnel
2. Light rail in tunnel
3. Light rail in median reservation with selected grade separations
4. Light rail in median reservation
5. Trackless trolley in median reservation
6. Busway in median reservation
7. Exclusive curb bus lanes

ALIGNMENT B (Midland Branch Railroad)

1. Commuter Rail
2. Rapid Transit
3. Light Rail

ALIGNMENT C (Crosstown)

1. Rapid Transit in Tunnel
2. Light Rail in Tunnel
3. Light Rail in Median Reservation
4. Light Rail in Street Traffic
5. Busway in Median Reservation

GENERALIZED ALTERNATIVES

- Generalized Alignment A**
- 1. Rapid transit in tunnel
 - 2. Light rail in tunnel
 - 3. Light rail in median reservation with selected grade separations
 - 4. Light rail in median reservation
 - 5. Trackless trolley in median reservation
 - 6. Busway in median
 - 7. Exclusive curb bus lane

- Generalized Alignment B**
- 1. Commuter rail
 - 2. Rapid transit
 - 3. Light rail

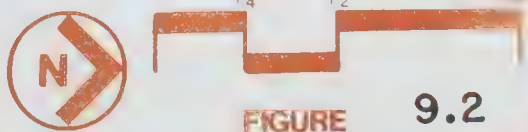
- Generalized Alignment C**
- 1. Rapid transit in tunnel
 - 2. Light rail in tunnel
 - 3. Light rail in median reservation
 - 4. Light rail in street traffic
 - 5. Busway in median reservation

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Other configurations on the three alignments were possible but were not examined in detail for the reasons stated below:

1. All Modes on Elevated Structures: Elevated structures are not environmentally compatible with the predominantly residential and retail commercial land use in the study area. Construction of such structures would not be in the best interests of upgrading the area and increasing its development potential. (Service provided by the existing Washington Street elevated is included as a base case alternative for comparative purposes only.)
2. Busway in Tunnel: The cost to construct and ventilate this type of system would outweigh any potential benefits from its implementation. A limited length tunnel might be feasible if required, particularly if it is used for trackless trolleys.
3. Busway on Alignment B (Midland Branch): The Midland Branch Railroad could provide potential right-of-way for a busway. However, this configuration would require that all rail service be taken off the Midland Branch. It would probably require that bus service be operated as a shuttle service without a desirable connection to local streets since the construction cost to provide such connections would be high and not in keeping with the concept of buses as a low capital cost solution. Benefits derived from such a system did not appear great enough to consider this alternative further.

Evaluation of the Alignments

A discussion of the three alignments irrespective of mode is contained in this section. Figure 9.3 indicates the most important considerations for each alignment.

Implementation of most major fixed-route alternatives on Alignment B (the Midland Branch) would be less costly than on Alignment A, since an exclusive right-of-way is available and two tracks are being upgraded as part of the Orange Line relocation project. However, north of Dudley Station and Uphams Corner, Alignment A offers significant advantages in terms of potential connections to existing lines, population served and replacement of current Orange Line service. In Roxbury, Alignment A generally provides superior service to commercial centers and has an important link to Dudley Station. South of Grove Hall, Alignment B serves more residential users, while Alignment A serves commercial establishments on Blue Hill Avenue.

Alignment C provides an important connection between Uphams Corner and the new Ruggles Street Station on the Orange Line with potential connection to a proposed circumferential transit system. However, Dudley Street is too narrow to provide for construction of any transit service in a median. Therefore, any major fixed-route alternatives on this alignment will require tunnelling, right-of-way acquisition, or possible selection of parallel streets such as the new Crosstown Street, which will have a reserved transit easement.

EVALUATION OF GENERALIZED ALTERNATIVES

Capital construction costs were tabulated for each of the generalized alternatives based on the unit cost estimates summarized in Table 9.2. (which were previously derived in Table 7.6). An estimate of the hourly

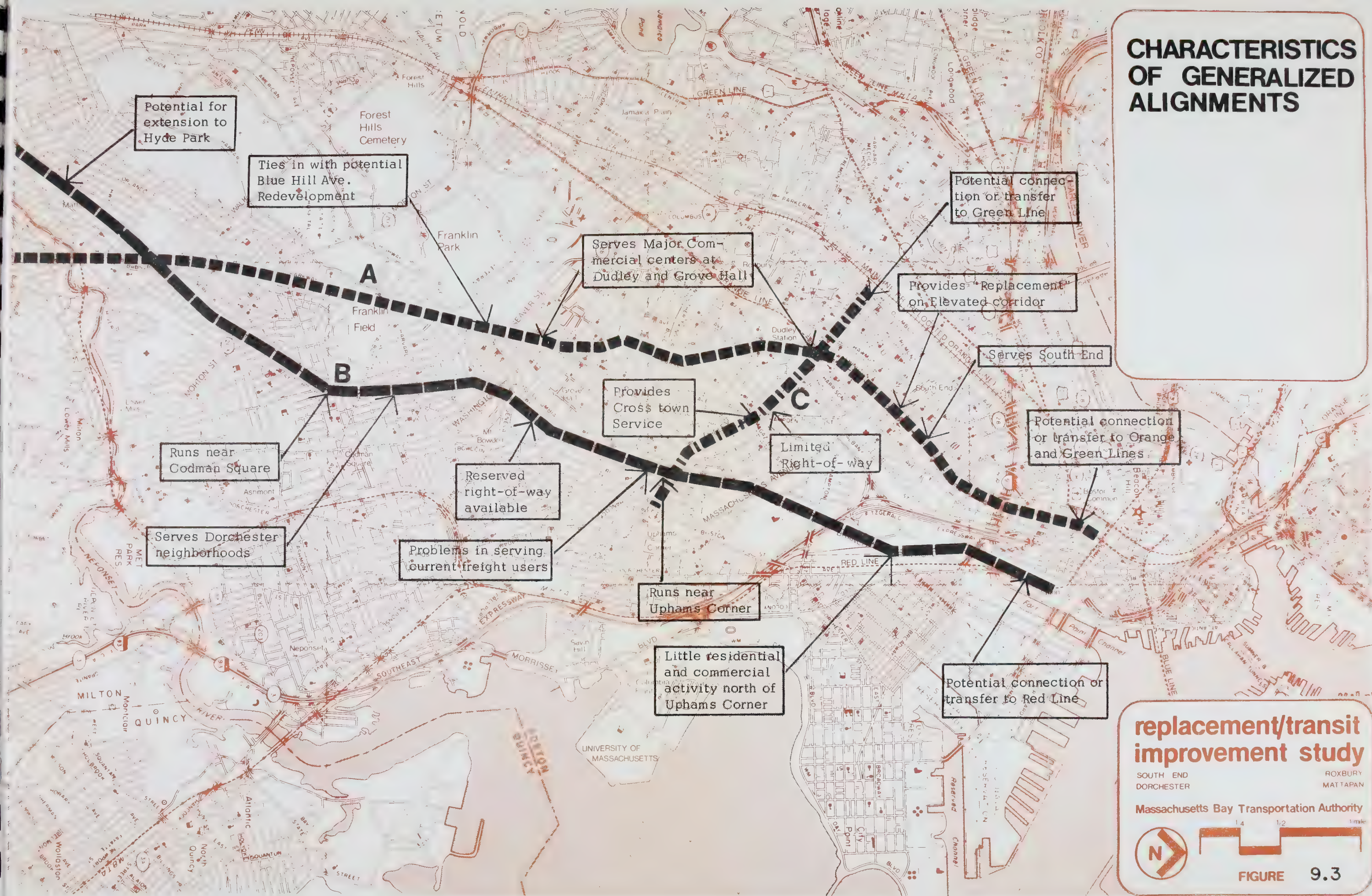
TABLE 9.2
SUMMARY OF UNIT CONSTRUCTION COSTS

<u>Mode</u>	Cost in Millions of 1977 Dollars		
	<u>Tunnel</u>	<u>Median Reservation</u>	<u>Midland Branch</u>
<u>Cost Per Mile</u>			
Commuter Rail	54-96*	-	1.8
Rapid Transit	54-96	-	5.8
Light Rail	54-96	6.1	4.6
Trackless Trolley	54-96	3.2	-
Bus	-	1.1	-
<u>Cost Per Station</u>			
Commuter Rail	21.0	-	0.5
Rapid Transit	21.0	-	3.2
Light Rail	16.0	0.1	0.5
Trackless Trolley	-	0.1	-
Bus	-	0.1	-

* Higher Cost for Deep-Bore Tunnelling

one-way passenger carrying capacity of each mode was made using the frequency and number of vehicles used in similar MBTA services. The important characteristics of each alternative under the categories of criteria given in Table 1.1 were described and are summarized in Figure 9.4.

CHARACTERISTICS OF GENERALIZED ALIGNMENTS



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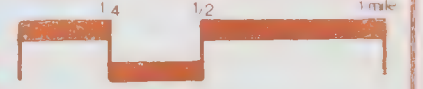
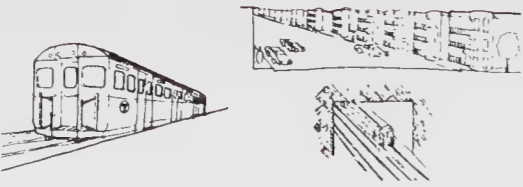
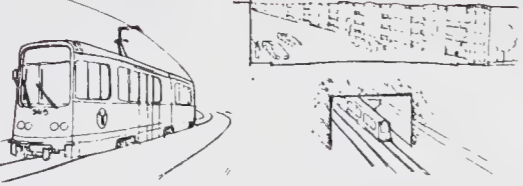




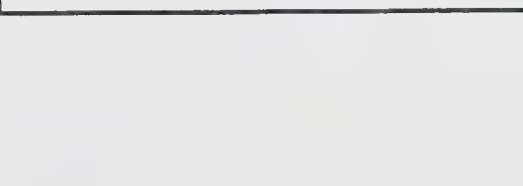


FIGURE 9.3

EVALUATION OF
GENERALIZED
ALTERNATIVES





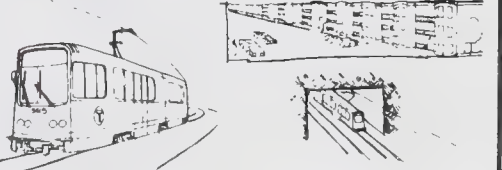



ALIGNMENT	TRANSPORTATION ALTERNATIVE	MODE - RIGHT OF WAY DIAGRAM	CAPITAL COST * (MILLIONS)	LINE CAPACITY (PASSENGERS PER HOUR)		TRANSPORTATION SERVICE	ENVIRONMENTAL/ RIGHT OF WAY FACTORS	LAND USE/ LAND DEVELOPMENT
				ASSUMED*** SYSTEM	POTENTIAL			
A	1. RAPID TRANSIT IN TUNNEL		540-800 **	7,100	25,000	Provides shortest travel time and . greatest carrying capacity. Frequent stops not feasible because of high station costs. Tie-in with Orange Line presents problems of split service.	Cut- and cover tunnelling produces significant adverse impact during construction in terms of noise, air pol- lution and disruption to pedestrian and vehicular traffic. Underground stations present potential security and crime problems.	Could provide major incentive to development in vicinity of stations.
A	2. LIGHT RAIL IN TUNNEL		590	3,300	17,000	Could provide travel speeds equi- valent to rapid transit. Frequent stops not feasible because of high station costs (although light rail stations are not as costly). Provides potential for tie-in with Green Line and Mattapan high-speed lines.	Cut- and cover tunnelling produces significant adverse impact during construction in terms of noise, air pol- lution and disruption to pedestrian and vehicular traffic. Underground stations present potential security and crime problems.	Could provide major incentive to development in vicinity of stations.
A	3. LIGHT RAIL IN MEDIAN RESERVATION (WITH SELECTED GRADE SEPARATIONS)		165	3,300	17,000	Slower speeds than 1 & 2 because of frequent grade-crossings. Frequent stops are feasible.	Potential right-of-way problems in Dudley Station area, although tunnels solve these problems in South cove and Grove Hall areas.	Could provide incen- tive for development along major streets.
A	4. LIGHT RAIL IN MEDIAN RESERVATION		55	3,300	17,000	Slower speeds than "3" because of grade crossings in South End, and Grove Hall areas.	Limited right-of-way in South Cove and Grove Hall areas require either right- of-way acquisition or limi- tations to parking and vehicular movements.	Could provide incen- tive for development along major streets.
A	5. TRACKLESS TROLLEY IN MEDIAN RESERVATION		20	1,600	5,000	Has potential for greater frequency of service than rail alternatives. Lacks flexibility of bus to circulate outside of major fixed-route. Traffic congestion impedes penetra- tion into downtown.	Quieter operation than bus. Could be later upgraded for use by light rail.	Could provide incen- tive for development along major streets.
A	6. BUSWAY IN MEDIAN		10	1,600	5,000	Has potential for greater frequency of service than rail alternatives. Provides less potential line haul capacity than rail alternatives. Provides flexibility for collec- tion/distribution outside major fixed routes. Traffic congestion impedes pene- tration into downtown.	Greater noise than rail or trackless trolley operations. Could be later upgraded for use by light rail.	Lesser investment in fixed-facilities pro- vides less incentive for development.
A	7. EXCLUSIVE BUS LANE AT CURB		5	1,600	5,000	Has potential for greater frequency of service than rail alternatives. Provides less potential line haul capacity than rail alternatives. Provides flexibility for collec- tion/distribution outside major fixed routes. Traffic congestion impedes penetra- tion into downtown. Enforcement required to keep lanes open will be difficult. Curb service safer and more con- venient to users.	Greater noise than rail or trackless trolley operations. Minimal right-of-way and construction impacts.	Virtually no investment in fixed-facilities pro- vides less incentive for development. Elimination of on-street parking at various times may present problems to commercial development.

* COSTS DO NOT INCLUDE RIGHT-OF-WAY ACQUISITION

** HIGHER COST FOR DEEP-BORE CONSTRUCTION

*** BASED ON SIMILAR MBTA SYSTEMS

EVALUATION OF GENERALIZED ALTERNATIVES

ALIGNMENT	TRANSPORTATION ALTERNATIVE	MODE - RIGHT OF WAY DIAGRAM	CAPITAL COST * (MILLIONS)	LINE CAPACITY (PASSENGERS PER HOUR)		TRANSPORTATION SERVICE	ENVIRONMENTAL/ RIGHT OF WAY FACTORS	LAND USE/ LAND DEVELOPMENT
				ASSUMED***	POTENTIAL			
B	1. COMMUTER RAIL		15	1,100	12,000	Provides least frequent service and potentially greatest station spacing than all alternatives. Fares currently charged for commuter rail are far higher than other MBTA services. South Station can be used as terminal. Provides fast travel speeds.	Noise impact on abutting properties.	Probably provides limited stimulus for development.
B	2. RAPID TRANSIT		75	7,100	25,000	Provides shortest travel time and greatest carrying capacity. Tie-in with Red Line would degrade service on Quincy and Ashmont branches. Possible long-term potential for tie-in with rail line proposed for reconstructed Central Artery. Limited room available for terminals at South Station.	Noise impact on abutting properties.	Could provide incentive for development at stations.
B	3. LIGHT RAIL		40	3,300	17,000	Could provide travel speeds equivalent to rapid transit. Limited room available for terminals at South Station. Difficult to tie into Green Line.	Noise impact on abutting properties.	Could provide incentive for development at stations.
C	1. RAPID TRANSIT IN TUNNEL		200	7,100	25,000	Provides shortest travel time and greatest carrying capacity. Frequent stops not feasible because of high station costs. Tie-in with Orange Line presents problems of split service.	Cut- and cover tunnelling produces significant adverse impact during construction in terms of noise, air pollution and disruption to pedestrian and vehicular traffic. Underground stations present potential security and crime problems.	Could provide major incentive to development in vicinity of stations.
C	2. LIGHT RAIL IN TUNNEL		190	3,300	17,000	Could provide travel speeds equivalent to rapid transit. Frequent stops not feasible because of high station costs (although light rail stations are not as costly). Provide potential for tie-in with Huntington Avenue Green Line and proposed circumferential transit.	Cut- and cover tunnelling produces significant adverse impact during construction in terms of noise, air pollution and disruption to pedestrian and vehicular traffic. Underground stations present potential security and crime problems.	Could provide major incentive to development in vicinity of stations.
C	3. LIGHT RAIL IN MEDIAN RESERVATION		20*	3,300	17,000	Slower speeds than 1 and 2 because of frequent grade crossings. Potential for frequent stops.	Extensive right-of-way acquisition and building demolitions required along Dudley Street and in Dudley Station area. Limited right-of-way in Campus High and LRCC areas.	Could provide incentive for development along major streets.
C	4. LIGHT RAIL IN STREET TRAFFIC		20	3,300	17,000	Extremely slow speeds because of grade crossings and conflict with vehicular traffic. Extremely slow speeds for vehicular traffic.	Minimal impact on right-of-way.	Lesser investment in fixed-facilities provides less incentive for development.
C	5. BUSWAY IN MEDIAN RESERVATION		5*	1,600	5,000	Has potential for greater frequency of service than rail alternatives. Provides less potential line haul capacity than rail alternative. Provides flexibility for collection/distribution outside major fixed route.	Extensive right-of-way acquisition and building demolitions required along Dudley Street and in Dudley Station area. Limited right-of-way in Campus High and LRCC areas.	Lesser investment in fixed-facilities provides less incentive for development.

* COSTS DO NOT INCLUDE RIGHT-OF-WAY ACQUISITION

** HIGHER COST FOR DEEP-BORE CONSTRUCTION

*** BASED ON SIMILAR MBTA SYSTEMS

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The following pages contain a more detailed evaluation of the fifteen generalized alternatives and recommendations for further analyses.

ALIGNMENT A - Washington/Warren/Blue Hill

A-1: Rapid Transit in Tunnel

Providing rapid transit service on Alignment A requires a continuous subway, therefore, the capital construction cost of this alternative (and alternative A-2) is substantially greater than all other alternatives considered. To be cost effective, rapid transit alternatives should provide commensurately greater benefits than other modes.

A major benefit of rapid transit is its ability to handle large volumes of passengers. Prior to the ridership forecasts made as part of the analysis of specific alternatives, a preliminary examination of ridership on the relocated Orange and existing Red Lines, and spacing of rail lines was made. This analysis indicated that passenger demand in this corridor could be accommodated in a light rail or bus system at far lower cost than a rapid transit alternative.

A rapid transit system on Alignment A would have to operate as a branch of the relocated Orange Line, and, therefore, provide the same kind of split service that is presenting problems in terms of transit operation and community response on the Red Line (see Chapter 6). It does have major advantages in eliminating conflict with surface traffic (after construction) and probably provides the greatest stimulus to land development at station nodes.

Another benefit of rapid transit service is travel speed. However, preliminary estimates indicated that travel time on Alignment A from Mat-tapan Square to downtown would be only marginally less than light rail systems either in tunnel or at-grade (see below):

Rapid transit in tunnel	16 min. (avg. sta. spacing = .6 mi.)
Light rail in tunnel	18 min. (avg. sta. spacing = .4 mi.)
Light rail at-grade (w/selected grade separations)	21 min. (avg. sta. spacing = .25mi.)
Light rail at-grade	24 min. (avg. sta. spacing = .2 mi.)

In spite of small travel time savings at a relatively high cost, this rapid transit alternative was examined because of the importance of obtaining ridership data on it for comparative purposes and because of community desires to examine a rapid transit option in more detail.

A-2: Light Rail in Tunnel

This alternative does not differ significantly from Alternative A-1 except that it would operate as a branch of the Green Line rather than the Orange Line in downtown. It offers faster service and less disruption to pedestrians and vehicles than surface light rail alternatives, but provides inferior access to stations because they are spaced further apart and located underground. This alternative was dropped from further consideration.

A-3: Light Rail in Median (w/selected grade separations) and A-4: Light Rail in Median

Both of these alternatives cost considerably less than the preceding two because they are located primarily at-grade. This factor decreases travel speed, but also permits closer spacing of stops and precludes the need for underground passenger access.

Both systems are intended to tie into the Green Line Central Subway which provides good downtown distribution and bypasses congested city streets. However, operations in the Central Subway are currently slow, although MBTA analysis has shown that the subway is operating well below its potential capacity.

Alternative A-3 contains tunnel sections under the Massachusetts Turnpike and through the Grove Hall area which require an additional \$100 million in capital costs. The right-of-way analysis in Chapter 8 indicated that a tunnel under the Massachusetts Turnpike was not justified, but that a tunnel in the Grove Hall area of Warren Street may be required.

Both alternatives provide fixed-rail service in the South End/Dudley/Grove Hall corridor at a far lower cost than underground alternatives, and were further evaluated as specific alternatives.

A-5: Trackless Trolley in Median

The trackless trolley alternative could operate in two basic ways: (1) as a shuttle between downtown and Mattapan Square or, (2) as a feeder system as well as a line haul system with local routes feeding into an exclusive right-of-way. The first solution would require persons to transfer from local feeder buses to the shuttle service. However, the latter solution would require a heavy investment in fixed overhead electrical power feed which would tend to preclude changing feeder routes as needs arose and might cause adverse visual impact on neighborhood streets. Consequently a shuttle system appeared more desirable for the trackless trolley mode.

The trackless trolley cannot offer the flexibility of the bus in out-lying areas nor the potential of light rail for bypassing downtown traffic congestion by using the Central Subway. It also would probably require construction of a new trackless trolley maintenance facility. However, the trackless trolley has lower noise and air pollution impact than the bus.

Because of its essential similarity with the bus, the trackless trolley alternative was not developed as a separate specific alternative in Phase I. Rather, all bus alternatives were considered to have capability for trackless trolley services, though the limitations of trackless trolley service were recognized.

A-6: Busway in Median

Like the trackless trolley, the bus could be operated as either a shuttle or feeder system. However, it is more feasible as a feeder system than the trackless trolley because it does not require overhead power on local streets. Consequently, a system with local bus routes feeding into a bus route using an exclusive median right-of-way was investigated. This type of feeder service would permit more people to have a one-seat ride to their destination than with fixed-rail alternatives.

A major disadvantage of bus or trackless trolley modes is that they have to compete with traffic congestion in order to penetrate downtown north of Stuart (Kneeland) Street. The auto-restricted zone (ARZ) or transit loop planned for the Washington Street downtown area has the potential for relieving much of this congestion.

As with the trackless trolley alternative, construction of a median for a busway could be a first step in implementing a light rail system. The feeder system busway concept was further developed as a specific alternative.

A-7: Exclusive Bus Lane at Curb

This alternative would utilize a reserved traffic lane adjacent to the curb for buses, either throughout the day or during peak hours. The primary advantages of this alternative are its very low capital cost and the fact that it provides for boarding at the curb rather than at a median, and therefore obviates the need for users to cross part of the street to gain access to a platform.

The alternative poses two major disadvantages: (1) massive problems of enforcement of traffic regulations, and, (2) need for prohibiting parking when the bus lane is in operation. Operating the exclusive lane during peak hours only reduces the parking prohibition problem,

particularly in the morning rush hour when most stores are closed. However, this would not permit buses to bypass traffic congestion during other parts of the day. An all-day parking prohibition could present real problems to local merchants who want auto access.

Because of potential enforcement problems and the fact that it runs counter to the important goal of upgrading local businesses along major streets, alternative A-7 was dropped as a means of improving bus operations for long distances on local arterials. However, reserved lanes could still be used for short lengths in downtown or elsewhere and will be examined where appropriate as part of other alternatives.

ALIGNMENT B: Midland Branch Railroad

B-1: Commuter Rail (Railroad)

The major advantage of implementing commuter rail service in the study area is the relative ease and low cost associated with its construction on the Midland Railroad. Limited commuter rail service on the Midland Branch with station stops at Morton Street, Uphams Corner and Fairmount will be instituted during reconstruction of the relocated Orange Line. Additional stations could be constructed at major street intersections where stations existed years ago when the line was used for passenger service. However, traditional commuter rail service involves characteristics such as high fares for short trips, fairly infrequent service, considerable distance between stops and poor downtown distribution that, if used alone are not well-suited to area travel needs.

The fare problem is significant, although it may be possible to reduce fares further if long term service is instituted. A first step in making fares more compatible with inner city travel needs will occur during interim Midland RR service. A monthly ticket from Uphams Corner Station will provide a \$.55 one-way fare and a free transfer to rapid transit MBTA lines. Service could be increased somewhat above traditional commuter rail frequency toward meeting area needs, but limited track space in South Station provides a very real capacity limitation. Distance between stops is greater in commuter rail because of poor acceleration/deceleration characteristics (see Chapter 7). These can be improved through electrification, but this would greatly increase the cost of implementation. The single downtown stop at South Station requires a transfer to the Red Line resulting in poor downtown distribution. This would be alleviated somewhat if the proposed North/South Station connection via a reconstructed Central Artery were to be implemented since service could be extended to a downtown stop. However, this project is many years away.

Despite these problems, the low cost of implementing rail service appeared attractive enough to utilize commuter rail in a specific alternative. Since the alignment could not serve the South End and Roxbury, it was tested in conjunction with other service in that corridor.

B-2: Rapid Transit

Rapid transit on the Midland Branch offers much of the same advantages of the mode on alignment A and would be far less expensive to implement. Ideally a rapid transit system would not terminate at South Station but be part of a system which can provide both downtown distribution and transfers to other lines. For alignment B, this would mean tying into the Red Line. However, the Red Line already has two branches, and adding a third would be operationally difficult or impossible. Any benefits derived from the new line would not appear to justify further deterioration of service on existing Red Line service.

For this reason a Red Line rapid transit branch on the Midland RR to South Station was dropped from further consideration. However, sections of the Midland Branch alignment south of Uphams Corner were used for specific rapid transit alternatives branching from the Orange Line.

B-3: Light Rail

Light rail on the Midland Branch requires less extensive station and signalling infrastructure than rapid transit, although running this mode to South Station involves the same inherent problems of downtown distribution and terminal space. The cost savings associated with running the line directly to South Station are negated by the lack of downtown distribution and failure to serve Dudley and the South End.

However, the Midland Branch south of Uphams Corner could be used for a light rail system connecting with a crosstown system (Alt.C-2 and C-3). This alignment was used in a number of specific alternatives. Note that both alternatives B-2 and B-3 would require construction of a third track on the Midland RR or elimination of the limited freight service now currently operating. All costs used considered a third track.

ALIGNMENT C: Uphams Corner/Dudley/Ruggles

C-1: Rapid Transit in Tunnel

A system using this alternative would probably run from the Relocated Orange Line to the Midland Branch RR. Such a system has the same disadvantages of alternative A-1 in that it is costly and produces split service on the Orange Line. It also provides the same advantages

of high capacity - high speed service with good downtown distribution, although split service will increase headways. This alternative was examined further as a link in an overall rapid transit system only for the purpose of obtaining ridership data.

C-2: Light Rail in Tunnel and C-3: Light Rail in Median Reservation

A light rail system on alignment C could either branch off the Huntington Avenue Green Line, be part of an overall circumferential transit system, or provide a link between a Washington Street radial line and the Midland Branch.

The advantages of a surface light-rail alternative have previously been discussed as part of alternative A-4. However, while alignment A contains streets with sufficient right-of-way to accommodate a median reservation with little or no property takings, alignment C generally does not offer this advantage (except in the area of the new Crosstown Street where transit right-of-way has been reserved). However, property takings on Dudley Street may be more appropriate because of considerable abandonment and could relate to redevelopment of the area. This alignment warranted further analysis because it provides an important connection between alignments A and B, with potential for extension of service eastward to Columbia Point and westward to the Fenway.

C-4: Light Rail in Street Traffic

This alternative was analyzed on alignment C because of limited right-of-way on Dudley Street. This "streetcar" arrangement provides unsatisfactory service due to conflict between light rail vehicles and rubber-tired vehicles operating on the same right-of-way. It becomes very difficult to maintain headways, and slow speeds (see Table 7.3) produce high travel times and increase rolling stock requirements to handle the same number of riders. These characteristics ruled out further analysis of this alternative in Phase I.

C-5: Busway in Median Reservation

This alternative shares the general characteristics of Alternative A-6. It has the same problem as Alternative C-3 in having limited right-of-way to work with in alignment C. A busway in this corridor would either require property acquisition on Dudley Street or use a totally different right-of-way. The potential cost-effectiveness of this mode indicated that it should be examined further to see if right-of-way problems could be solved.

Summary

Recommendations for the selection of all or parts of generalized transit alternatives for further analysis as specific alternatives are summarized in Table 9.3.

TABLE 9.3

CONCLUSIONS BASED ON ANALYSIS OF
GENERALIZED ALTERNATIVES

<u>GENERALIZED ALTERNATIVE</u>		<u>CONCLUSIONS</u>		
		Analyze Further as a Specific Alt. in Phase I	Analyze Further as part of Specific Alt. in Phase I	Do Not Analyze Further
<u>Alignment A (Washington/Warren/Blue Hill)</u>				
1.	Rapid transit in tunnel	X		
2.	Light rail in tunnel			X
3.	Light rail in median reservation with selected grade separations	X		
4.	Light rail in median reservation	X		
5.	Trackless trolley in median reservation	X		
6.	Busway in median reservation	X		
7.	Exclusive curb bus lane			X
<u>Alignment B (Midland RR)</u>				
1.	Commuter rail	X *		
2.	Rapid transit		X	
3.	Light rail		X	
<u>Alignment C (Uphams Corner/Dudley/Ruggles)</u>				
1.	Rapid transit in tunnel		X	
2.	Light rail in tunnel	X		
3.	Light rail in median reservation	X		
4.	Light rail in street traffic			X
5.	Busway in median reservation	X		

* In conjunction with other modes

SPECIFIC ALTERNATIVES IDENTIFIED FOR PHASE I ANALYSIS

A series of specific transit alternatives were identified for further evaluation based on results from the analysis of generalized alternatives and additional agency, community and consultant recommendations during the course of Phase I. The general procedure followed was for the consultant to recommend a series of alternatives for further analysis. These were then discussed at weekly coordinating meetings with agency and community representatives leading to acceptance, modification, addition or deletion of alternatives. Prior to analysis, the resulting alternatives (with one or two exceptions because of scheduling problems) were presented at a Project Working Committee Meeting for approval.

The alternatives were described in enough detail to provide input to the transit ridership model and to estimate approximate capital and operating costs. The following characteristics were delineated:

1. Horizontal alignment
2. Profile (vertical alignment)
3. Connections to existing service
4. Potential stops or station locations
5. Speed on various segments of the system
6. Service frequency (headway)
7. Feeder bus system including routes, headways and travel speeds
8. Fares

The number of vehicles per train did not have to be specified in advance of running the model because ridership estimates are not constrained by vehicle or train capacity. However, the number of vehicles required to handle projected ridership was calculated after the model was run, in order to estimate vehicle purchase and operating costs (see Appendix C for details on the ridership model).

The eleven specific alternatives selected for analysis are shown schematically in Figure 9.5 and described in Table 9.4. Detailed characteristics of each alternative are specified in Appendix E.

Although alternatives employing rapid transit, commuter rail and light rail modes are reasonably self-explanatory, the bus alternatives (6, 9 and 10) require further explanation.

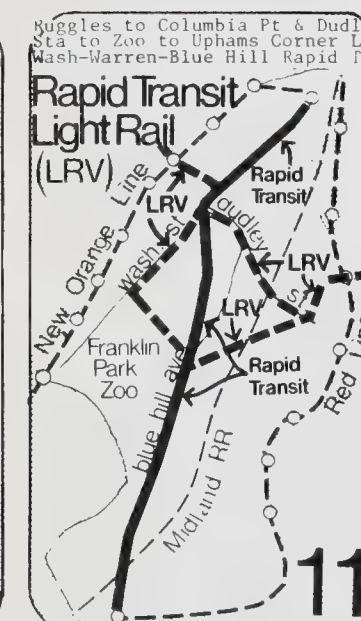
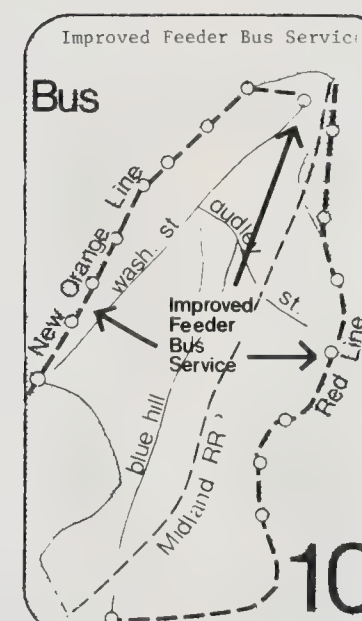
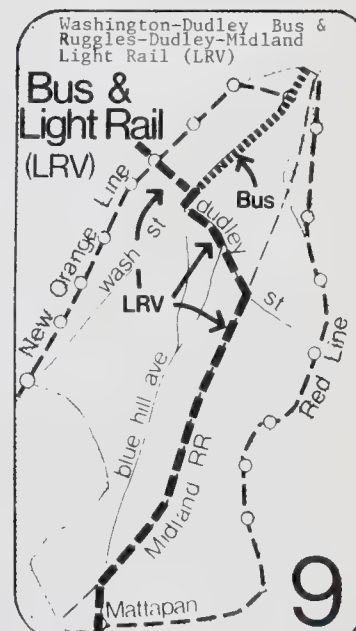
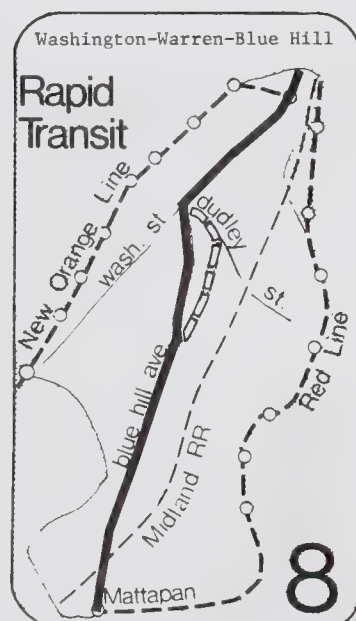
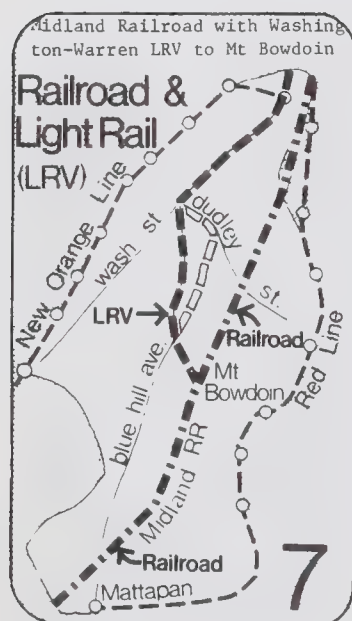
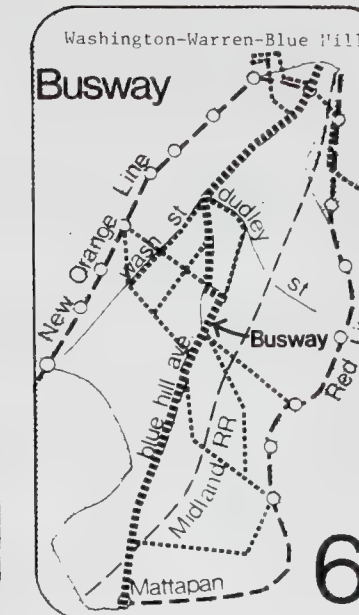
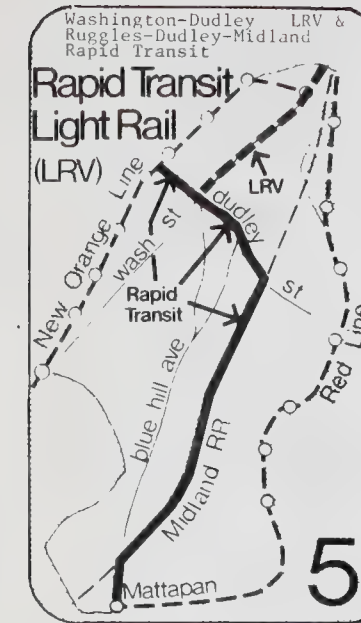
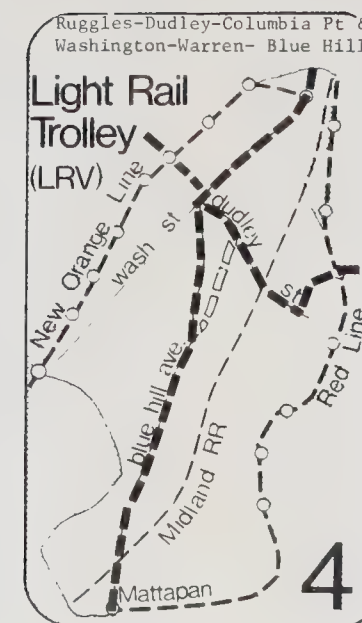
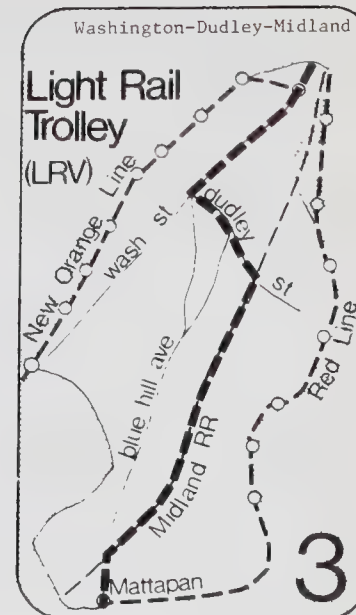
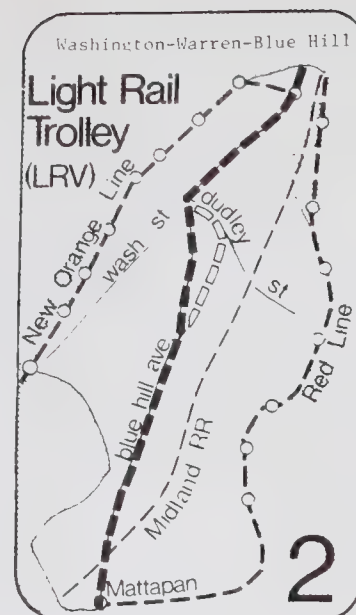
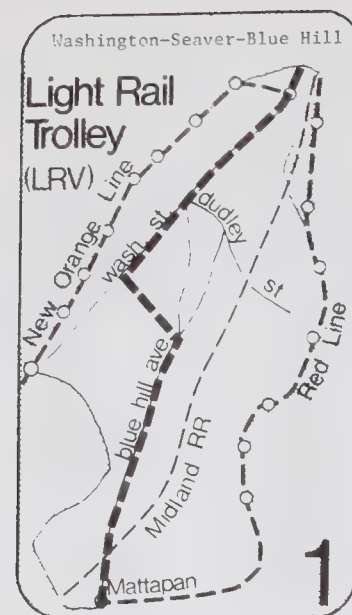
Alternative 6 is a two-lane busway in a median reservation constructed on Blue Hill Avenue, Warren Street and Washington Street. A number of local bus routes from the southern part of the study area feed into the busway at major intersections and are routed either downtown into the proposed A.R.Z. or to stations on the relocated Orange Line. Since this type of system is unique in Boston and rare in other cities (see Table 7.4), a preliminary traffic analysis of the busway was made. This analysis which is contained in Appendix F, indicated that the concept could work well but that more detailed traffic analyses will be required in Phase II. The preliminary analysis in Appendix F was used to estimate overall capacity limitations on the busway, and to estimate average bus operating speeds.

Alternative 9 has a busway constructed only in the South End from the downtown A.R.Z. to Dudley. Because this is a more localized service, stops were spaced at about one-half the distance specified for Alternative 6. This shuttle system could lend itself to trackless trolley

SPECIFIC ALTERNATIVES

VEHICLE TYPE

- LIGHT RAIL (Trolley)
- BUS in busway
- .-.- RAILROAD
- RAPID TRANSIT



replacement/transit improvement study

SOUTH END
DORCHESTER

ROXBURY
MATTAPAN

Massachusetts Bay Transportation Authority



FIGURE 9.5

<u>No.</u>	<u>Mode</u>	<u>Connecting To</u>	<u>Horizontal Alignment</u>	<u>Vertical Alignment</u>
1	Light Rail	Green Line @ Boylston Station	Washington St. - South End to Dudley Washington St. - Dudley to Egleston	At-grade At-grade* or tunnel
			Seaver St. - Egleston to Blue Hill Ave. Blue Hill Ave. - Seaver St. to Mattapan Sq.	At-grade At-grade
2	Light Rail	Green Line @ Boylston Station	Washington St. - South End to Dudley Warren St. - Dudley to Townsend Warren St. - Townsend to Blue Hill Ave.	At-grade At-grade At-grade* or tunnel
			(Blue Hill Ave. - Dudley to Grove Hall)** Blue Hill Ave. - Grove Hall to Mattapan Sq.	At-grade* or tunnel At-grade
3	Light Rail	Green Line @ Boylston Station	Washington St. - South End to Dudley Dudley St. - Dudley Sta. to Midland RR Midland RR - Dudley to Blue Hill Ave. Blue Hill Ave. - Midland RR to Mattapan Sq.	At-grade At-grade* or tunnel At-grade At-grade
4	Light Rail	Green Line @ Boylston Station Green Line @ Huntington Ave.	Same as Alternative "2" Ruggles St. - Huntington Ave. to Ruggles Station Crosstown St. - Ruggles Station to Washington St. Washington St. - Crosstown to Dudley Dudley St. - Dudley to Columbia Rd. Columbia Rd. - Dudley to Columbia Station Mt. Vernon St. - to Columbia Point	 At-grade* At-grade At-grade At-grade* or tunnel At-grade At-grade
5	Light Rail	Green Line @ Boylston Station	Washington St. - South End to Dudley Sta.	At-grade
	Rapid Transit	Orange Line @ Ruggles Station	Dudley St. - Ruggles Station to Midland RR Midland RR - Dudley to Blue Hill Ave. Blue Hill Ave. - Midland RR to Mattapan Sq.	Tunnel At-grade Tunnel
6	Busway - (with Feeder System)	Proposed ARZ	Washington St. - South End to Dudley Warren St. - Dudley to Quincy Quincy St. - Warren to Blue Hill Ave. Blue Hill Ave. - Quincy St. to Grove Hall Blue Hill Ave. - Grove Hall to Mattapan Sq.	At-grade At-grade At-grade* At-grade* At-grade

* Land takings required
** Alternative route

<u>No.</u>	<u>Mode</u>	<u>Connecting To</u>	<u>Horizontal Alignment</u>	<u>Vertical Alignment</u>
7	Light Rail	Green Line @ Boylston Station	Washington St. - South End to Dudley Warren St. - Dudley to Townsend Warren St. - Townsend to Grove Hall (Blue Hill Ave. - Dudley to Grove Hall)**	At-grade At-grade At-grade* or tunnel At-grade* or tunnel
	Commuter Rail	South Station	Washington St. - Grove Hall to Midland RR Midland RR - South Station to Readville	At-grade* or tunnel At-grade
8	Rapid Transit	Orange Line @ Essex Station	Washington St. - South End to Dudley Warren St. - Dudley to Blue Hill Ave. (Blue Hill Ave. - Dudley to Grove Hall)** Blue Hill Ave. - Grove Hall to Mattapan	Tunnel Tunnel Tunnel Tunnel
9	Bus Light Rail	Proposed ARZ Green Line @ Huntington Ave.	Washington St. - South End to Dudley Ruggles St. - Huntington Ave. to Ruggles Station Crosstown Street - Ruggles to Washington St. Washington St. - Crosstown to Dudley Dudley St. - Dudley to Midland RR Midland RR - Dudley St. to Blue Hill Ave. Blue Hill Ave. - Midland RR to Mattapan Sq.	At-grade At-grade* or tunnel At-grade At-grade At-grade* or tunnel At-grade At-grade
10	Bus	-	A system of improved feeder service with more routes and more frequent service (see Appendix E)	-
11	Rapid Transit	Orange Line @ Essex Station	Same as Alternative 8	-
	Light Rail	Green Line @ Huntington Ave.	Same as Crosstown leg of Alternative 4	-
	Light Rail	Proposed Cross-town Light Rail @ Dudley	Washington St. - Dudley to Egleston Seaver St. - Egleston to Blue Hill Ave. Columbia Rd. - Blue Hill Ave. to Dudley St.	At-grade* or tunnel At-grade At-grade

replacement/transit
improvement study

SOUTH END
DORCHESTER

ROXBURY
MATTAPAN

Massachusetts Bay Transportation Authority
DESCRIPTION OF
SPECIFIC ALTERNATIVES
TABLE 9.4

operation because of the mode's superior environmental characteristics (although it would require overhead wire in the downtown A.R.Z., which could be considered a visual problem).

Alternative 10 is an improved feeder bus system. This system introduces a few new bus routes above those planned for the relocated Orange Line and increases frequency on a number of other routes (see Appendix E). Besides feeder service, downtown bus service on Washington Street is also included.

EVALUATION OF SPECIFIC ALTERNATIVES

In the following section, the eleven specific transit alternatives are evaluated against the transit criteria established during the study and shown in Table 1.1.

A. COMMUNITY GOALS

1. Meets Community Goals
2. Community Acceptance

Community goals vary throughout the study area. Comments received from residents of the various zones of service in relation to new transit alternatives are listed below on the basis of the community contacts established during the study (see Chapter 5).

Zone 1 (South End)

- Strong preference for light rail over bus alternatives
- Provide Replacement Service prior to demolition of the Washington Street El or as soon as possible thereafter
- Want new service with speed and downtown distribution of existing Orange Line with more stops in South End
- Want a service which will stimulate development along Washington Street
- Want a service which provides expedient free transfer to other MBTA lines (particularly for non-CBD-oriented trips)

Zone 2 (Roxbury)

- Reinforce existing commercial nodes @ Dudley, Grove Hall and Uphams Corner
- Provide Replacement Service to Dudley prior to demolition of the Washington Street Elevated or as soon as possible thereafter
- Prefer rapid transit or light rail over bus

- Prefer Warren Street alignment over Blue Hill Avenue or Midland Branch
- If rail service is put on Midland Branch north of Grove Hall, provide other parallel service
- Provide expedient transit from the southern areas to Dudley and vice-versa
- Retain Dudley as a major interchange point
- Use transit to stimulate development

Zone 3 (Dorchester/Mattapan)

- Don't bring back trolleys on Blue Hill Avenue
- Encourage commercial revitalization of Blue Hill Avenue with fixed rail transit as a stimulus
- New service may not be needed if short-term improvements are made
- Providing a median reservation on Blue Hill Avenue could lead to pedestrian safety problems because of current high-speed automobile traffic
- Don't implement a new system which would drastically change neighborhood character
- Provide fast service from Mattapan to CBD

Zone 4 (crosstown) - Same as Zone 2

B. TRANSPORTATION SERVICE

1. Replaces Washington Street Elevated

All alternatives provide service on Washington Street from Dudley Station north, which is the area which will most directly lose transit service when the Elevated is relocated. Alternatives 1 and 11 continue the service as far as Egleston and hence most nearly correspond to the narrow meaning of "replacement service". However, all alternatives using the Warren/Blue Hill alignment (Alternatives 2, 4, 6, 7, 8 and 11) may be considered to provide equivalent replacement service since they serve the corridor currently having the highest volume bus connections to the Orange Line at Dudley Station.

2. Serves Major Commercial Centers

Table 9.5 indicates how each transit alternative serves the major commercial centers in the study area (exclusive of feeder bus service).

TABLE 9.5
SERVICE TO MAJOR COMMERCIAL CENTERS

CENTER	Commercial Space (1000's of s.f.)	ALTERNATIVE										
		1	2	3	4	5	6	7	8	9	10	11
Dudley	611	**	**	**	**	**	**	**	**	**		**
Uphams Corner	421			*	**	*		*		*		**
Egleston	120	**										**
Grove Hall	320	*	**		**		**		**			**
Codman Square	325			*		*		*		*		
Mattapan Square	400	**	**	**	**	**	**	*	**	**		**

** Direct Service

* Nearby Service

(Note: All alternatives include feeder bus service to all centers. This service is not shown in Table 9.5).

All alternatives serve the South End and Dudley, the areas most dependent on current Orange Line service. Egleston Square is served by Alternatives 1 and 11 only. Midland Branch alternatives (3, 5, 7 and 9) run 1,000 feet from Uphams Corner and so have lesser impact than alternatives 4 and 11 which run directly through the area. However, a stop on the Midland Branch should have a positive impact on the shopping area. Midland Branch alternatives run 2,000 feet from Codman Square and would appear to have only minimal impact on commercial activity at the Square.

Alternative 11 which directly serves six major centers, and Alternative 4, which serves five, provide the best coverage.

3. Travel Time Improvements

Table 9.6 indicates the savings in travel time between centers of the study area and various points in the Boston area if the various transit alternatives were to be implemented. Savings are calculated relative to Base Case 2 - the relocated Orange Line with proposed feeder bus system. Travel times include average walking time, transfer time (if required), and time on feeder bus (if required), in addition to time spent on the transit vehicle.

Table 9.6 was prepared to assist local residents in determining which transit alternative would best improve trips they made regularly. Total aggregate travel time savings for each alternative were also tabulated and are shown in Table 9.9 as part of the cost-effectiveness analysis.

TABLE 9.6

RELATIVE TRAVEL TIME SAVINGS BETWEEN CENTERS

		Travel Time Savings (Minutes) for Alternative										
From	To	LRV 1	LRV 2	LRV 3	LRV 4	LRV, R.T. 5	BUS 6	RAIL, LRV 7	R.T. 8	LRV, BUS 9	BUS 10	R.T., LRV 11
Dudley Sq.	Uphams Corner	0	0	2	7	0	0	0	0	2	0	7
	Gov't Center	5	5	5	5	5	0	5	6	0	0	6
	Prudential	0	0	0	11	1	4	0	0	10	0	11
	Allston	0	0	0	2	0	3	0	0	2	0	2
	Central Sq.	8	8	8	8	8	6	8	9	5	0	9
Uphams Cor.	Dudley	0	0	2	7	0	0	0	0	2	0	7
	Gov't Center	0	0	0	2	2	0	0	0	0	0	2
	Prudential	0	0	0	13	7	0	0	0	8	0	13
	Allston	0	0	0	4	0	0	0	0	0	0	4
	Central Sq.	0	0	0	0	0	0	0	0	0	0	0
Grove Hall	Dudley	0	4	0	4	0	3	4	6	0	0	6
	Uphams Cor.	0	3	5	4	0	3	3	3	0	3	10
	Govt. Center	4	8	0	8	3	3	8	11	1	1	11
	Prudential	0	3	0	9	3	4	3	6	4	0	10
	Allston	1	5	1	5	1	6	5	0	1	3	0
	Central Sq.	7	11	0	11	4	8	11	11	0	2	11
Egleston Sq.	Dudley Sq.	11	1	5	0	5	10	1	1	5	5	11
	Uphams Cor.	0	0	4	0	7	0	0	0	4	0	13
	Govt. Center	1	0	0	0	0	0	0	0	0	0	0
	Prudential	0	0	0	0	0	0	0	0	0	0	7
	Allston	0	1	1	5	1	5	1	1	1	4	4
	Central Sq.	3	0	0	0	0	0	0	0	0	0	0
Ashmont	Dudley	0	2	0	2	3	3	2	4	0	0	0
	Uphams Cor.	0	0	2	0	1	0	0	0	2	0	6
	Govt. Center	0	0	0	0	0	0	0	1	0	0	1
	Prudential	0	0	0	2	5	3	0	0	6	0	2
	Allston	0	0	0	0	0	0	0	0	0	0	0
	Central Sq.	0	0	0	0	0	0	0	0	0	0	0
Mattapan Sq.	Dudley Sq.	21	23	21	23	24	22	14	26	21	4	26
	Uphams Cor.	6	4	16	11	16	5	5	7	16	0	17
	Govt. Center	16	18	17	18	19	12	9	22	14	0	22
	Prudential	11	13	11	20	19	12	1	20	20	0	22
	Allston	8	10	9	10	14	12	2	5	10	0	5
	Central Sq.	5	7	4	7	6	3	3	9	0	0	9

Note: All times relative to Base Case 2 (Relocated Orange Line)

4. Schedule Adherence

In general, the less conflict that transit vehicles have with vehicular traffic or other transit vehicles, the greater their chances of adhering to schedules. For this reason, the rapid transit or commuter rail alternatives are likely to be the most reliable, the surface light rail alternatives somewhat less reliable (since they must face cross-street vehicular traffic and potential transit congestion in the Central Subway) and the bus alternatives least reliable (since buses conflict directly with other vehicular traffic when outside the busway reservation area).

5. Comfort

Overcrowding is the major source of rider discomfort and all transit alternatives would be designed to handle peak hour passenger loads without excessive overcrowding. Ridership forecasts indicate a peak hour one-way passenger volume ranging from 2,900 on light rail and bus alternatives to 4,400 on rapid transit alternatives. This volume can be handled comfortably in the systems chosen. In fact, a three car LRV train running at five minute headway has an hourly capacity of 5,800 passengers and could easily accommodate the passenger volumes forecast for rapid transit.

Two other criteria which can be examined are comfort associated with having a seated ride and the discomfort associated with frequent stopping. The probability of a seated ride is greatest with commuter rail vehicles since these are not designed to accommodate any standees. Commuter rail and rapid transit are always located on exclusive right-of-way and, therefore, do not have to stop for cross traffic as do buses and light-rail vehicles operating on streets (although such stopping can be minimized through use of traffic preemption systems). In addition, commuter rail and rapid transit stations are more widely spaced, and therefore involve less frequent stops at stations.

6. Safety

All systems would be designed to be as safe as possible. With respect to safety of persons along the right-of-way, the alternatives in tunnel present the fewest automobile traffic safety hazards. Design of crosswalks and fencing would be geared to minimize safety problems for alternatives using streets and Midland RR right-of-way.

7. Security

Security of transportation users will be an important design consideration in Phase II of the study. It is difficult to rate the various alternatives in this respect because of trade-offs. For example, the

subway alternatives could present security problems in access to subway stations. On the other hand, subway stations are likely to have attendants on duty throughout the service day.

8. Transfers

Two aspects of transfer activity were examined in evaluating alternatives:

- (a) Does the alternative minimize the number of transfers which must be made to frequently desired destinations?
- (b) Does the alternative permit easy transfer to other MBTA services for trips to other destinations?

The minimum number of transfers from study area residential neighborhoods to downtown and Back Bay can generally be achieved in the busway alternative (6) since buses can operate on local streets as well as the busway and therefore minimize the need for feeder bus service. All other alternatives require about the same number of transfers, although light rail alternatives with closer spacing would require somewhat fewer feeder bus trips than rapid transit alternatives. The number of transfers required on the minimum path for transit trips between commercial centers (as opposed to residential neighborhoods) is shown in Table 9.7.

All light rail and rapid transit alternatives provide good access to other transit services since both Green and Orange Lines provide free underground transfers to all MBTA rail lines. Commuter rail and bus alternatives provide inferior transfer service since each requires payment of an additional fare (except for interim Midland Railroad service) and a less convenient walk between services. The busway alternative would have stops above downtown stations on all MBTA lines, while commuter rail provides direct access to only the Red Line.

9. Service to Elderly and Handicapped

In terms of mode, there is a trade-off for the needs of the elderly and handicapped. Rapid transit stations are underground and are located further apart than bus or light-rail stops and therefore provide inferior access. On the other hand, rapid transit stations would have high platforms and ramps/elevators for wheelchairs and as such would be easier to use when they are reached. Light rail vehicles as currently designed cannot accommodate wheelchairs although some buses can.

TABLE 9.7
TRANSFER REQUIREMENTS

		NUMBER OF TRANSFERS REQUIRED										
		ALTERNATIVE										
From	To	LRV 1	LRV 2	LRV 3	LRV 4	LRV, R.T. 5	BUS 6	RAIL, LRV 7	R.T. 8	LRV, BUS 9	BUS 10	R.T., LRV 11
Dudley	Uphams Corner	0	0	0	0	0	0	0	0	0	0	0
	Gov't Center	0	0	0	0	0	0	0	0	0	1	0
	Prudential	0	0	0	0	0	0	0	0	0	0	0
	Allston	1	1	1	1	1	1	1	1	1	1	1
	Central Square	1	1	1	1	1	1	1	1	1	1	1
Uphams Cor.	Dudley Square	0	0	0	0	0	0	0	0	0	0	0
	Gov't Center	1	1	0	1	0	1	1	1	1	1	1
	Prudential	0	0	0	0	0	0	0	0	0	0	0
	Allston	1	1	1	1	1	1	1	1	1	1	1
	Central Square	0	0	0	0	0	0	0	0	0	0	0
Grove Hall	Dudley Square	0	0	0	0	0	0	0	0	0	0	0
	Uphams Corner	1	0	1	0	0	0	0	0	0	0	0
	Gov't Center	0	0	1	0	1	0	0	0	1	1	0
	Prudential	1	1	1	1	1	0	1	1	1	1	1
	Allston	1	1	2	1	2	1	1	1	2	2	1
	Central Square	1	1	1	1	2	1	1	1	1	1	1
Egleston Sq.	Dudley Square	0	0	0	0	0	0	0	0	0	0	0
	Uphams Corner	0	0	1	0	1	0	0	0	1	0	0
	Gov't Center	0	0	0	0	0	0	0	0	0	0	0
	Prudential	0	0	0	0	0	0	0	0	0	0	1
	Allston	1	2	2	2	2	2	2	2	2	2	2
	Central Square	1	1	1	1	1	1	1	1	1	1	1
Ashmont	Dudley Square	0	1	0	1	0	0	1	1	0	0	0
	Uphams Corner	0	0	0	0	0	0	0	0	0	0	1
	Gov't Center	1	1	0	1	0	0	1	1	1	1	1
	Prudential	1	1	1	1	0	0	1	1	0	1	1
	Allston	1	1	1	1	1	1	1	1	1	1	1
	Central Square	0	0	0	0	0	0	0	0	0	0	0
Mattapan Sq.	Dudley Square	0	0	0	0	0	0	1	0	0	0	0
	Uphams Corner	1	1	0	1	0	1	0	1	0	1	1
	Gov't Center	0	0	0	0	0	0	1	0	1	1	0
	Prudential	1	1	1	1	0	1	1	1	0	1	1
	Allston	1	1	1	1	2	2	2	1	1	2	1
	Central Square	1	1	1	1	1	1	1	1	1	1	1

10. Speed of Implementation

This factor was analyzed in two separate areas: implementation on the Washington Street "replacement corridor", and implementation elsewhere. Constructing a tunnel for rapid transit on Washington Street while the Elevated is still operating would require complete underpinning of the structure and entail excessively high costs which would be difficult to justify. When this problem was examined during the Orange Line relocation study, an option to use Shawmut Avenue to carry southbound tracks with northbound tracks located on Washington Street was examined. This option was considered unacceptable by the South End community because of the extensive underpinning required to prevent damage to historic buildings along Shawmut Avenue during construction. In addition, the South End Hispanic community was opposed to the negative impact on their development in the Shawmut Avenue area. Therefore it appears that construction of a rapid transit alternative on Washington Street could not be started until after the Elevated had been removed, which would entail a gap in providing permanent service of at least 4 to 5 years.

Light rail and busway alternatives at-grade on Washington Street could be constructed (at least in part) prior to demolition of the Elevated. A brief reconnaissance and engineering analysis indicated that it might be possible to operate light rail service on Washington Street while the Elevated is in operation. However, it is obvious that construction would be less expensive, be less damaging to auto traffic, and be faster and "cleaner" if the elevated structure was removed before construction begins. This will be examined in greater detail during Phase II.

Bus or trackless trolley service without a median reservation could be implemented on Washington Street in less time than rail options. Under any option, replacement bus service on Washington Street or adjacent streets would be provided in the interim period (if any) between removal of elevated service and inauguration of replacement service.

Regarding system implementation throughout the study area, improved feeder bus service (Alternative 10) could be implemented with only minor construction and purchase of new vehicles. The railroad portion of Alternative 7, which requires only new station construction is also a possibility for speedy implementation. The bus alternative, requiring median construction and development of the auto restricted zone could be implemented sooner than either light rail or rapid transit alternatives. Light rail alternatives at-grade could be constructed more quickly than rapid transit alternatives in subway.

11. Impact on Other Transportation Services

All light rail alternatives join the Green Line Central Subway. By increasing the number of trains in the subway and using the existing junction at Boylston Street, travel times on other Green Line branches would be increased. The magnitude of this travel time increase cannot be measured precisely since it is largely a function of the performance and reliability of the new LRV and remaining PCC cars, and it is too soon to make such an evaluation. In any event, it is likely that future travel time on all Green Line branches will be improved over existing conditions because of better vehicle reliability.

The specific light rail alternatives also run on the surface in median reservations. The median reservation requires a width equivalent to three traffic lanes and therefore will decrease the vehicular capacity of the streets on which it is constructed. However, the transit line will also decrease the demand for vehicular usage of the streets on which it runs. Phase II analysis will determine the magnitude of disruption to vehicular traffic and look at potential traffic engineering solutions on all streets having proposed surface transit lines.

Rapid transit alternatives run on exclusive grade-separated rights-of-way and so will not reduce vehicle capacity (except during construction). However, rapid transit alternatives will require split service on the Orange Line, thereby decreasing frequency on the Forest Hills Branch.

The busway alternative (6) involves median construction and similar reduction in vehicle carrying capacity as light rail. In the downtown area it involves almost twice as many bus movements into the ARZ (auto-restricted zone) as currently planned. Its impact upon traffic and pedestrian movements in the ARZ will be analyzed further in Phase II.

The commuter rail alternative (7) will require increased utilization of platforms at South Station. This impact could degrade operations at the Station where platforms are limited and potential for expansion is also limited.

All services will reduce peak hour passenger loads on Red and Orange Lines and thus provide additional capacity for these lines to handle any future increases in demand.

12. Potential for Incremental Construction, Future Upgrading and Expansion

If required by physical or fiscal constraints, all transit alternatives could be constructed incrementally. (Note: it would not make sense to construct less than the entire length of the low capital cost railroad segment in alternative 7).

Construction of alternatives using rail modes should be phased from north to south, or west to east, so that lines can tie into existing Green or Orange Lines and thus provide passenger service on these lines and access to maintenance yards. Also, segments should be long enough to provide sufficient access along the line and to feeder buses to justify running a branch service. As a minimum, the first phase of implementation of any of the alternatives should run as far as Dudley Station.

The alternatives can all be expanded beyond their currently indicated limits if required in the future. In particular, rapid transit and light rail alternatives could be extended south on the Midland Branch into Hyde Park as far as Readville. Further expansion of alternatives along streets are also possible. Light rail or busway branches which could run at-grade lend themselves more easily to expansion than rapid transit, because of cost considerations.

The busway alternative could be upgraded to light rail to accommodate future demand increases because the reservation would have already been constructed. Upgrading from light rail on streets to rapid transit in a subway would be costly because of the extensive tunnelling required.

C. TECHNOLOGY AND SYSTEM COMPATIBILITY

1. Proven Technology

All alternatives employ transportation modes currently being operated by the MBTA and other transit agencies. The Authority has been experiencing problems with the new light rail vehicles. However, it has not yet been determined whether or not this will be a long-term problem.

2. Compatibility with MBTA Equipment

Again, all modes consider equipment now being operated by the MBTA.

3. Compatibility with MBTA Labor Practices

Operations on all modes in each alternative can conform to current MBTA labor practices.

D. COST EFFECTIVENESS

Introduction

Three factors were used to measure the cost-effectiveness of the eleven specific transit alternatives:

1. Capital cost
2. Cost per transit rider
3. Ratio of cost to travel time savings

Capital cost is a measure of the cost required to implement the proposed transit alternative. It clearly shows the implications of the various alternatives in terms of allocating both federal funds (80% of the total) and local funds (20% of the total). It is an important consideration in examining transit improvements in terms of regional and national priorities.

The remaining two factors examine total system cost (capital plus operating) in terms of two other quantitative measures of system effectiveness: ridership and travel time savings. The number of riders on a given proposed system helps determine its viability as an operating entity. The number of "new" riders that the proposed alternative attracts to the overall MBTA system measures potential revenue and indicates how well the system is fulfilling regional goals in diverting people from auto to transit, which in turn decreases traffic congestion, air pollution and energy consumption. Travel time savings (sometimes called "user benefits") measure overall improvements in service for current transit users.

The three factors reflect concerns of the transit user, the operating agency (MBTA) and the funding agency (UMTA). In comparing the relative cost-effectiveness of the alternatives, small differences in the cost-effectiveness factors were not considered significant because Phase I analysis did not permit precise estimates of cost and transit rider analysis.

The remainder of this section will derive the factors used in the analysis and then compare the specific alternatives on the basis of cost-effectiveness.

Cost Factors

This section presents a brief definition of the cost elements in the cost-effectiveness analysis. More detailed information on unit costs is contained in Chapter 7.

Capital Cost

Capital cost is the cost (in 1977 dollars) of construction and equipment for each transit alternative. All light rail alternatives consider options for either tunnelling or right-of-way acquisition in areas where median reservations cannot be provided with the existing right-of-way (see Chapter 8). Consequently, a range of costs is given; the lower end of the range tabulates the cost for a median reservation at-grade (without property acquisition costs) while the upper range tabulates that for a tunnel. More detailed Phase II analysis is required to determine which option (for light rail at-grade or partial tunnel) is preferred in each case. However, it should be noted that the cost of acquiring property along the alignment (even though not yet calculated) would be considerably less than tunnel construction. Table 9.8 gives the total capital cost of each specific alternative.

Annual Operating Cost

Operating costs include costs to operate and maintain the new service proposed in each alternative. Potential revenue was not considered. The operating costs consider any reduction in bus operating cost derived from either eliminating or reducing service on local bus routes in each alternative system. Thus operating cost is a measure of the cost to operate and maintain the total area transit system in relation to Base Case 2.

Total Annual Cost

The cost-effectiveness analysis primarily used total annual cost as a means of incorporating the cost of construction, equipment purchase and depreciation, and system operation and maintenance into a single measure. Total annual cost is equal to amortized capital costs plus net operating costs. Capital costs for fixed facilities were assumed to be amortized over a 50 year life at a 6 per cent annual rate of interest. Capital costs for the rail vehicles and buses were assumed to be amortized over a 25 and 15-year period, respectively, also at 6 per cent annual rate of interest. No salvage value was assumed for either fixed facilities or rolling stock. Table 9.9 shows the components and total annual cost for the eleven specific alternatives.

Transit Ridership

Table 9.10 shows the number of riders forecast in 1985 to use the new service proposed in each alternative in addition to the Relocated Orange Line and the Ashmont Branch of the Red Line. Also tabulated are the number of "new riders" or auto diversions which include those riders who would use the new system if it were implemented, but otherwise would use automobiles. All other riders forecast to use the new service would be diverted from other MBTA transit services.

TABLE 9.8
CAPITAL COST OF TRANSIT ALTERNATIVES

Millions of 1977 Dollars

<u>Alternative</u>		<u>Construction Cost</u>	<u>Vehicle Purchase</u>	<u>Total Capital Cost</u>	<u>Federal Share (80%)</u>
1	Light Rail				
	At-grade	64.7	19.5	84.2	67.4
	Partial Tunnel	169.2	19.5	188.7	151.0
2	Light Rail				
	At-grade	64.1	19.5	83.6	66.9
	Partial Tunnel	106.7	18.2	124.9	99.9
3	Light Rail				
	At-grade	64.0	17.6	81.6	68.3
	Partial Tunnel	170.3	17.6	187.9	150.3
4	Light Rail				
	At-grade	129.3	31.9	161.2	129.0
	Partial Tunnel	171.9	30.6	202.5	162.0
5	Rapid Transit/LRV	278.3	36.6	314.9	251.9
6	Busway	9.0	6.4	15.4	12.3
7	LRV/Commuter Rail				
	At-grade	67.7	25.0	92.7	74.2
	Partial Tunnel	159.0	23.7	182.7	146.2
8	Rapid Transit	604.4	33.0	637.4	509.9
9	Light Rail/Bus				
	At-grade	38.3	15.4	53.7	43.0
	Partial Tunnel	144.5	15.4	159.9	127.9
10	Local Bus	*	5.7	5.7	4.6
11	Rapid Transit/LRV				
	At-grade	701.6	63.0	764.6	611.7
	Partial Tunnel	914.1	63.0	977.1	781.7

* Cost of street improvements were not calculated

TABLE 9.9
TOTAL ANNUAL COST

		Annual Cost (millions of 1977 dollars)		
<u>Alternative</u>		<u>Capital</u>	<u>Operating</u>	<u>Total</u>
1	Light Rail			
	At-grade	5.6	3.4	9.0
	Partial tunnel	12.2	4.2	16.4
2	Light Rail			
	At-grade	5.6	4.1	9.7
	Partial tunnel	8.2	4.1	12.3
3	Light Rail			
	At-grade	5.5	3.7	9.2
	Partial tunnel	12.2	4.4	16.6
4	Light Rail			
	At-grade	10.7	7.2	17.9
	Partial tunnel	13.3	7.2	20.5
5	Rapid Transit/LRV	20.5	9.3	29.8
6	Busway	1.3	7.4	8.7
7	LRV/Commuter Rail			
	At-grade	6.3	4.2	10.5
	Partial tunnel	12.0	4.7	16.7
8	Rapid Transit	40.9	9.2	50.1
9	Light Rail/Bus			
	At-grade	3.9	4.4	8.3
	Partial tunnel	10.6	5.2	15.8
10	Local Bus	0.6	4.5	5.1
11	Rapid Transit/LRV			
	At-grade	49.4	15.5	64.9
	Partial tunnel	63.9	17.3	81.2

TABLE 9.10

ESTIMATED RIDERSHIP ON SPECIFIC TRANSIT ALTERNATIVES

Total 1985 Daily Riders (Inbound Trips)					
Alt.	Mode or Segment	Proposed ¹ Service	Relocated Orange Line ³	Red (Ashmont) Line	New ² Riders
Base Case 1		-	31,000	26,900	-
Base Case 2		-	47,700	26,900	-
1	Light Rail	21,400	38,100	23,100	3,520
2	Light Rail	23,600	38,500	23,100	3,810
3	Light Rail	25,000	39,600	20,100	2,930
4	Radial LRV	23,000	39,300	21,400	7,550
	Crosstown LRV	13,300			
	Total	36,300			
5	Rapid Transit	25,200	37,200	18,400	3,740
	Light Rail	4,600			
	Total	29,800			
6	Busway ⁴	27,000	39,200	21,500	4,980
7	Light Rail	14,600	40,300	22,800	1,530
	Commuter Rail	5,000			
	Total	19,600			
8	Rapid Transit	28,100	36,500	21,800	4,490
9	Light Rail	22,500	37,700	21,100	3,700
	Bus	3,600			
	Total	26,100			
10	Local Bus	- ⁵	48,700	25,500	3,440
11	Rapid Transit	28,700	33,500	20,800	7,910
	Crosstown LRV	10,200			
	Loop LRV	4,400			
	Total	43,300			

Notes

- 1 Persons transferring between rail lines are counted only once
- 2 New riders of public transit in the area who presently use automobiles (calculated relative to Base Case 2)
- 3 Existing Orange Line Elevated
- 4 Riders who travel on busway for at least part of their trip
- 5 Riders on proposed service cannot be tabulated separately from current users

The radial light rail lines (Alternatives 1, 2 and 3) running from the South End to Mattapan attract daily riders in the range of 21,000 to 25,000 regardless of alignment. The rapid transit lines (5 & 8) generate only slightly higher ridership (25,000 to 30,000) than equivalent light rail alternatives. The busway alternative attracts 27,000 daily riders, although a calculation of total ridership on the busway alternatives is necessarily arbitrary because of its dual local/line haul function. (Note: Alternate 6 ridership includes riders who used the busway itself for at least part of their trip.) Ridership on commuter rail is substantially lower than other alternatives because of less frequent service and a less convenient downtown connection (South Station) even though its service is extended further south than other lines.

Most of the alternatives tend to reduce daily ridership on the Relocated Orange Line by about 10,000. The major exception is Alternative 10, the improved feeder bus system, which increases Orange Line ridership slightly. Red Line ridership is decreased by 4,000 to 8,000 daily with the greatest decreases coming when light rail or rapid transit service is put on the Midland Branch.

New riders comprise 8 to 20 per cent of total riders. This relatively low proportion is due to the fact that the study area is currently very transit-dependent. The low end of this range is found in Alternative 7, which provides infrequent service in the Dorchester-Mattapan area where most of the potential new riders are generated. Alternative 4 is at the high end of the range (20.7% of total riders) because the crosstown alignment generates a high proportion of new riders.

New and total transit ridership for the eleven alternatives are shown graphically in Figure 9.6.

Travel Time Savings

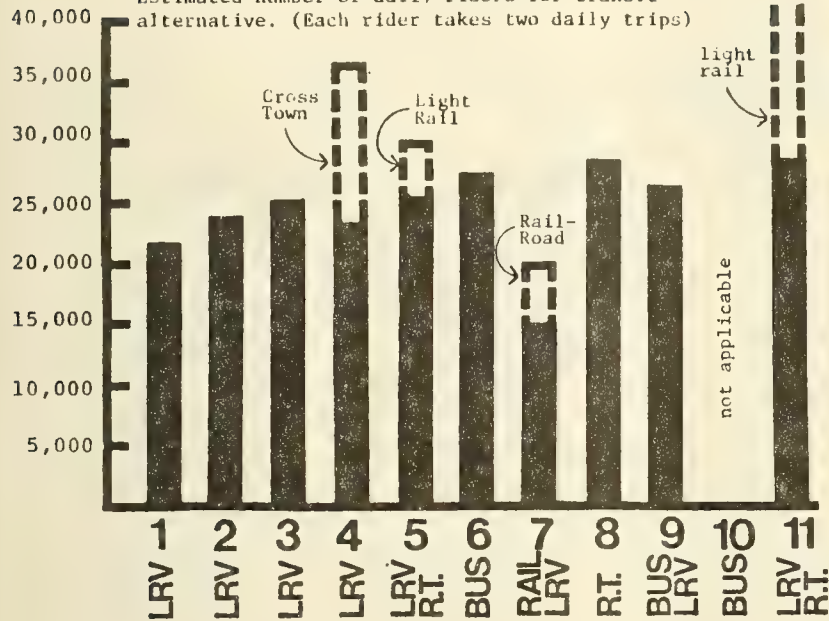
Table 9.11 indicates overall daily travel time savings (in hours) for transit users throughout the Boston (EMRPP) region. Virtually all of these travel time savings are induced within the study area where the impact of the proposed transit alternatives is greatest. These totals are based on output from the Ridership Model.

Table 9.11 indicates that substantially greater overall travel time savings are achieved in Alternatives 4 and 11 which contain the greatest areawide transit coverage. The two other rapid transit alternatives (5 & 8) are at an intermediate level of 5,000 hours saved while all other alternatives

ESTIMATED RIDERSHIP

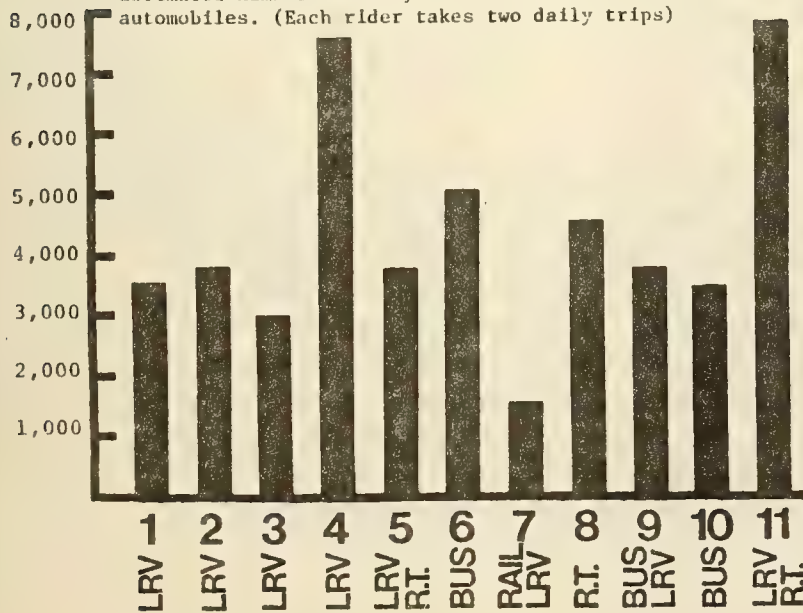
TOTAL DAILY RIDERS

Estimated number of daily riders for transit alternative. (Each rider takes two daily trips)



NEW RIDERS

Estimated number of daily transit riders who now use automobiles. (Each rider takes two daily trips)



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DORCHESTER

ROXBURY
MATTAPAN

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FIGURE 9.6

are at substantially the same overall level of time savings (2,400 - 3,600 hours). These travel time savings were converted to cost savings by applying a cost per hour saved (see Table 9.13).

TABLE 9.11
AGGREGATE TRAVEL TIME SAVINGS

<u>Alternative</u>	<u>Daily Hours Saved *</u>	<u>Alternative</u>	<u>Daily Hours Saved *</u>
1 LRV	2,650	7 Rail, LRV	2,650
2 LRV	3,640	8 R.T.	4,970
3 LRV	2,980	9 LRV, Bus	3,560
4 LRV	6,790	10 Bus	2,400
5 LRV, R.T.	4,970	11 R.T., LRV	8,610
6 Bus	3,560		

* Relative to Base Case 2

Cost-Effectiveness Comparison

1. Capital Cost

Total capital cost for each alternative was given previously in Table 9.8. Capital costs vary widely. Both bus and busway alternatives have low costs because of limited construction requirements. Light rail alignments are in an intermediate level at a range of \$80-200 million, depending upon the extent of tunnelling required. Rapid transit alternatives are substantially higher due to a need for extensive tunnelling. Alternative 5, which uses the Midland Branch Railroad for much of its length, is considerably less costly than Alternatives 8 and 11 which run in subway along their entire length.

2. Cost Per Transit Rider

Table 9.12 shows a comparison of cost per passenger trip (or rider) which divides total annual cost by total annual forecast of riders. Because variation in ridership between alternatives is substantially less than cost variation, the cost per rider ratio is primarily a function of variation in capital and operating costs. The table indicates that bus and light rail alternatives are at about the same level of cost per rider (particularly if light rail can be implemented at-grade). Rapid transit-oriented alternatives 5, 8 and 11, all have a considerably higher ratio. Alternative 7 has a cost/rider ratio equivalent or higher than the rapid transit alternatives because of the low number of new riders generated by commuter rail.

TABLE 9.12
ANNUAL COST PER RIDER

<u>Alternative</u>	<u>Total Annual Cost (millions)</u>	<u>Annual New Riders (millions)</u>	<u>Total Annual Riders (millions)</u>	<u>Annual Cost per New Rider (\$)</u>	<u>Annual Cost per Total Rider (\$)</u>
1 Light Rail					
At-grade	9.0	2.1	12.8	4.30	0.70
Partial tunnel	16.4			7.80	1.30
2 Light Rail					
At-grade	9.7	2.3	14.2	4.20	0.70
Partial tunnel	12.3			5.30	0.90
3 Light Rail					
At-grade	9.2	1.8	15.0	5.10	0.60
Partial Tunnel	16.6			9.20	1.10
4 Light Rail					
At-grade	17.9	4.5	21.8	4.00	0.80
Partial tunnel	20.5			4.60	0.90
5 Rapid Transit	29.8	2.2	17.9	13.50	1.70
6 Busway	8.7	3.0	16.2	2.90	0.50
7 LRV/Commuter Rail					
At-grade	10.5	0.9	11.8	11.70	0.90
Partial tunnel	16.7			18.60	1.40
8 Rapid Transit	50.1	2.7	16.9	18.60	3.00
9 Light Rail/Bus					
At-grade	8.3	2.2	15.7	3.80	0.50
Partial tunnel	15.8			7.20	1.00
10 Local Bus	5.1	2.1	*	2.40	*
11 Rapid Transit/LRV					
At-grade	64.9	4.7	26.0	13.80	2.50
Partial tunnel	81.2			17.30	3.10

* Not Applicable

3. Ratio of Cost to Travel Time Savings

Table 9.13 compares alternatives by a ratio of total annual cost to annual travel time savings in dollars. Travel time savings are sometimes referred to as "user benefits" and are derived by applying a factor which is based on a value of a person's time. The travel time savings shown in Table 9.11 were converted to cost by using a factor of \$3.00 per hour saved. The \$3.00 figure was used in the MBTA's Program for Mass Transportation (PMT) and in calculating benefits for the Orange Line relocation in the Southwest Corridor EIS.

Table 9.13 indicates that the ratio is lowest for bus alternatives, varies considerably for light rail alternatives depending on vertical profile, and is highest for rapid transit.

Summary

The cost-effectiveness factors are shown graphically in Figure 9.7. These bar charts indicate that all cost-effectiveness factors are most favorable for bus and least favorable for rapid transit alternatives. Specific alternatives utilizing light rail fall in the middle range. Light rail alternatives approach the cost-effectiveness of bus options if the number of tunnel sections can be minimized.

E. ENVIRONMENTAL FACTORS

1. Required Takings of Land/Structures/Parks/Historical Sites

Both rapid transit alternatives run in subway or on already available right-of-way and would require little or no property acquisition. The commuter rail portion of Alternative 7 runs on the Midland Railroad right-of-way and would not require any takings since an additional track would probably not be required. Alternatives which require a third track on the Midland Branch alignment would necessitate the minor property takings described in Chapter 8. All other alternatives have insufficient right-of-way in some sections (see Figure 8.1). These deficiencies are correlated with alternatives in Table 9.14.

Phase II analysis will define whether solutions in these critical areas will involve tunnelling or property acquisition for those alternatives still remaining. More detailed analysis of impacts on parks and historical sites will also be made during Phase II. Such impact appears to be minor under any of the alternative alignments.

TABLE 9.13
RATIO OF COST TO TRAVEL TIME SAVINGS

<u>Alternative</u>	<u>Total Annual Cost (\$ Million)¹</u>	<u>Annual Travel Time Savings² (\$ Million)</u>	<u>Ratio of Cost to Travel Time Savings</u>
1 Light Rail			
At-grade	9.00	2.38	3.8
Partial tunnel	16.40		6.9
2 Light Rail			
At-grade	9.70	3.28	3.0
Partial tunnel	12.30		3.8
3 Light Rail			
At-grade	9.20	2.68	3.4
Partial tunnel	16.60		6.2
4 Light Rail			
At-grade	17.90	6.11	2.9
Partial tunnel	20.50		3.4
5 Rapid Transit	29.80	4.47	6.7
6 Busway	8.70	3.20	2.7
7 LRV/Commuter Rail			
At-grade	10.50	2.38	4.4
Partial tunnel	16.70	2.38	7.0
8 Rapid Transit	50.10	4.47	11.2
9 Light Rail/Bus			
At-grade	8.30	3.20	2.6
Partial tunnel	15.80		4.9
10 Local Bus	5.10	2.16	2.4
11 Rapid Transit/LRV			
At-grade	64.90	7.75	8.4
Partial tunnel	81.20		10.5

Notes

¹ See Table 9.9.

² Daily travel time savings in Table 9.8 multiplied by 300 days per year and \$3 per hour.

TABLE 9.14

SPECIFIC ALTERNATIVES WITH RIGHT-OF-WAY DEFICIENCIES

<u>Street</u>	<u>Between</u>	<u>Distance (Miles)</u>	<u>Alternatives Impacted</u>
Washington	Mass. Pike-Msgr. Reynolds	.51	1,2,3,4,6,7,9,11
Washington	Crosstown Arterial-Dudley	.25	1,2,3,4,6,7,9,11
Washington	M.L. King-Egleston .	.53	1,11
Blue Hill	Dudley-Grove Hall	1.30	2,4,6,7
Warren	Townsend-Grove Hall	.53	2,4,6,7
Dudley	Warren-Columbia Road	1.30	2,3,4,6,7,9,11
Ruggles	Huntington-Columbus	.30	4,11

2. Impact on Pedestrian/Bicycle Movements

Alternatives 5 and 8 on exclusive rights-of-way will have virtually no impact on pedestrian or bicycle movement. All other alternatives involve at-grade service which can have positive or negative impacts on pedestrian and bicycle movements depending on detailed design. These details are a part of Phase II of the study.

3. Neighborhood Disruption/Cohesion

Real impacts on neighborhoods are often a function of community perception of their impact. However, no major construction of at-grade facilities (which could be construed as a physical barrier) is required in any alternative.

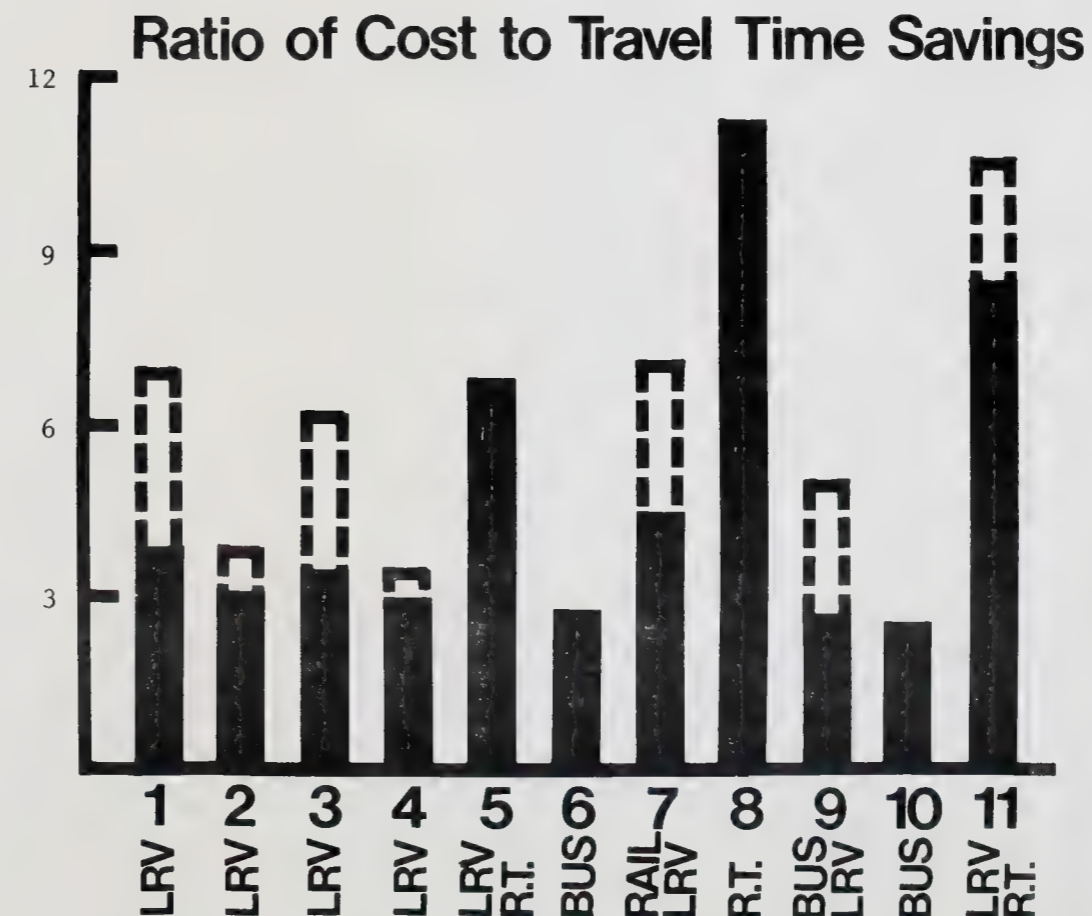
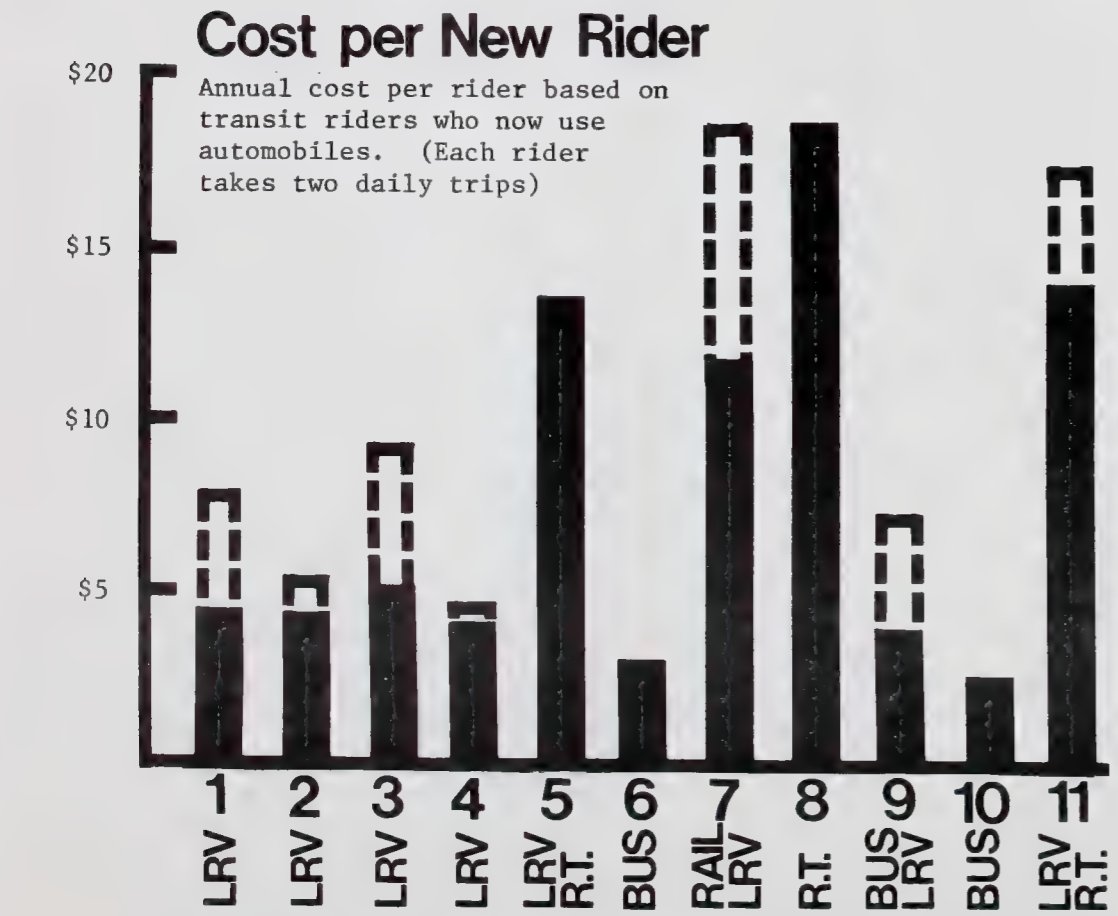
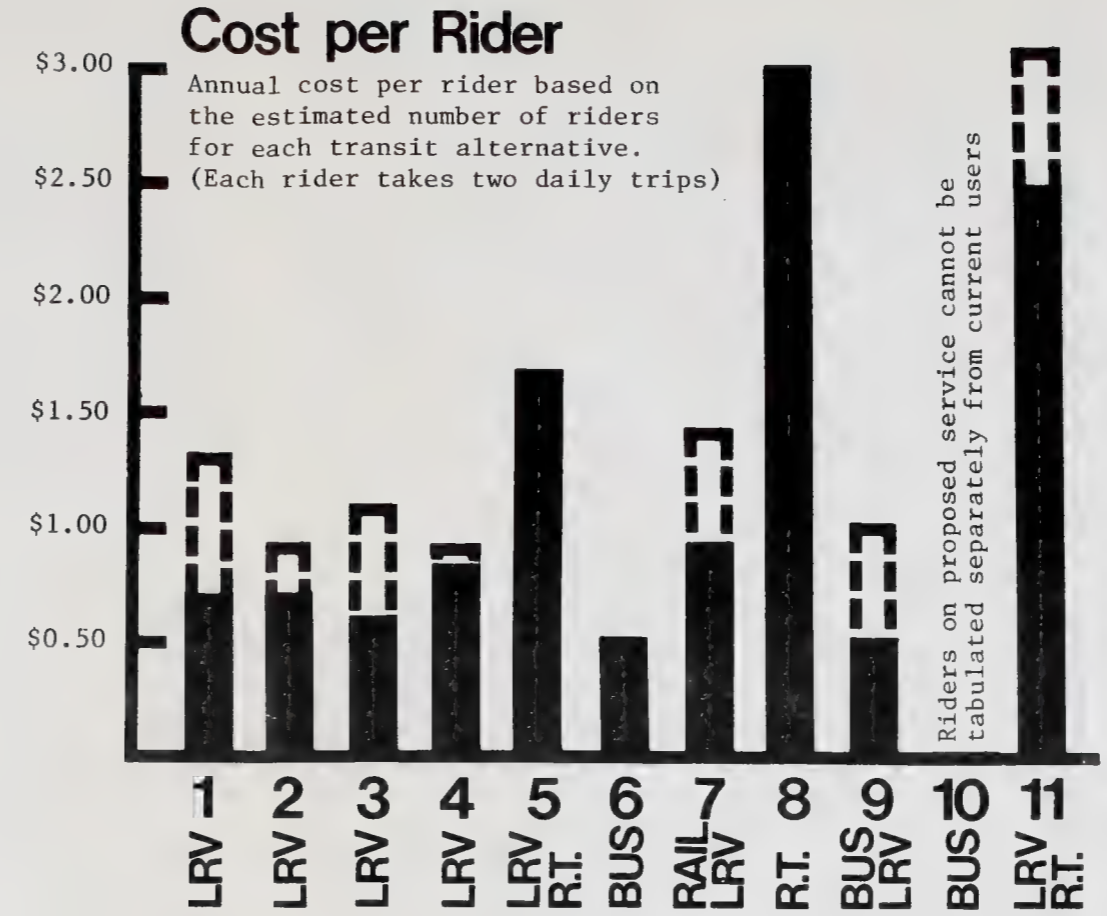
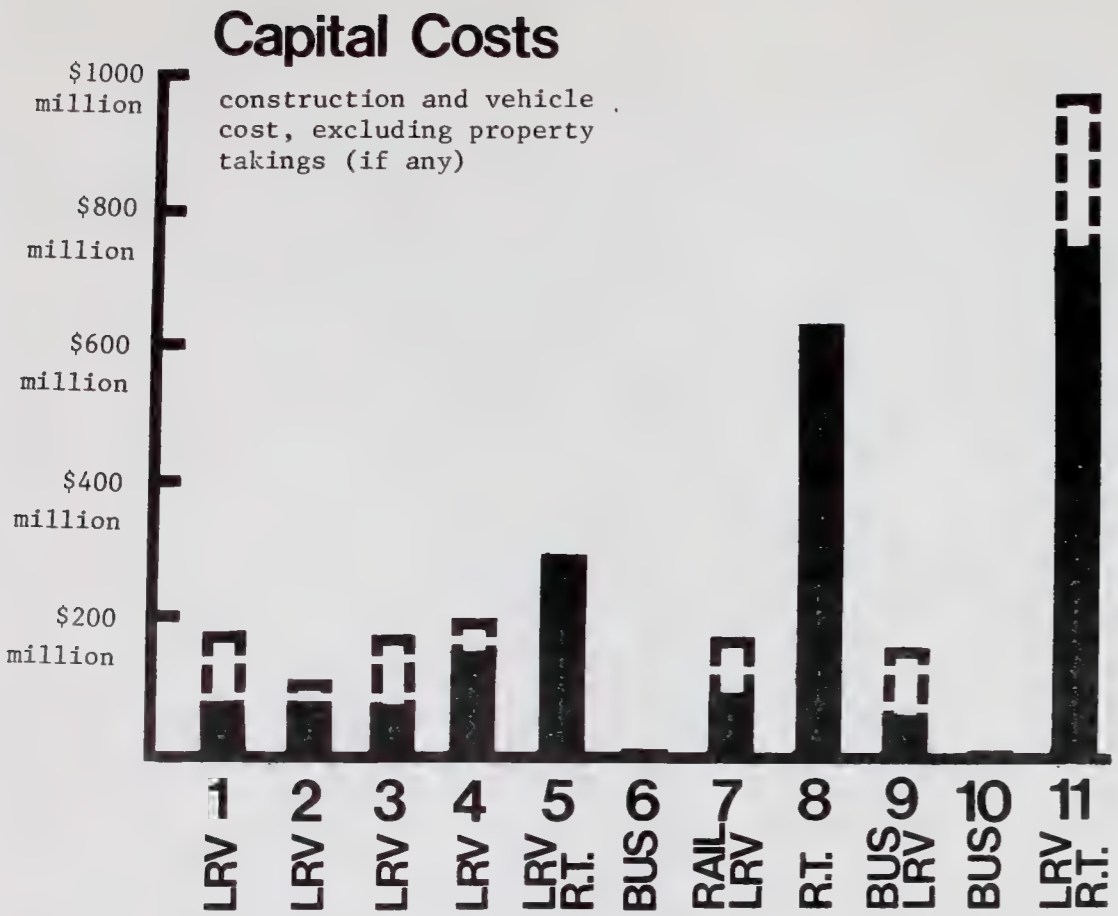
4. Construction Disruption

Major construction disruption would result from cut-and-cover tunnel construction in either rapid transit or light rail alternatives. This disruption would require temporary rerouting of traffic on various sections of the street as construction proceeded. The deep bore technique of tunnel construction would obviate the need for such disruption but entails very high costs. Construction of light rail and busway reservations will severely disrupt streets during a shorter construction period but probably can be staged so as not to completely stop traffic on the street. Commuter rail and feeder bus alternatives would involve the least disruption during construction.

COST EFFECTIVENESS FACTORS FOR TRANSIT ALTERNATIVES EVALUATED IN PHASE 1

ADDITIONAL COST IF PARTIAL TUNNEL REQUIRED

MINIMUM COST



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FIGURE 9.7

5. Noise Impacts

A detailed evaluation of transit noise, and procedures for reducing impacts along the alignments will be made during Phase II. However, a rough comparison of noise impacts by mode can be made at this stage. Bus, rapid transit and commuter rail vehicles produce higher noise levels than light rail. Bus noise can be reduced by utilizing trackless trolleys, but at a higher cost and limitation on system flexibility. Rapid transit noise in subway would have minimal impact on adjacent residences except during construction.

6. Air Pollution

7. Energy Consumption

Detailed evaluation of air pollution and energy factors is beyond the scope of Phase I analysis. However, a preliminary comparison can be made by examining the reduction in automobile travel associated with each specific alternative shown in Table 9.15. This analysis does not take into account the energy consumed and pollutants emitted by each transit system, but differences in transit are expected to be less significant than automobile factors.

TABLE 9.15

REDUCTION OF AUTOMOBILE VEHICLE MILES OF TRAVEL (VMT)

Daily Miles Reduced from BaseCase 2

<u>Alt.</u>	<u>Auto VMT</u>	<u>Alt.</u>	<u>Auto VMT</u>
1 LRV	40,300	7 Rail, LRV	17,600
2 LRV	44,900	8 R.T.	55,700
3 LRV	32,600	9 LRV, Bus	38,000
4 LRV	85,300	10 Bus	30,500
5 LRV, R.T.	44,500	11 LRV, R.T.	95,400
6 Bus	56,100		

Table 9.15 indicates that the reduction in automobile VMT is proportional to the new riders (or auto diversions) generated by each specific alternative. It indicates that the crosstown link in Alternatives 4 and 11 is significant in reducing automobile travel, while the commuter rail line in Alternative 7 provides the least reduction in auto travel.

F. LAND USE/LAND DEVELOPMENT

1. Impact on Existing and Proposed Land Uses
2. Enhancement of Land Development Goals
3. Impact on Land Values

Area land development goals have concentrated on improving the viability of commercial and residential land uses. Relative land development impact is a function of both mode and alignment. In terms of mode, development impact is a function of the volume of users, and likelihood of long term operation. The range of total passengers for rapid transit, light rail and busway alternatives are similar, with commuter rail well below the other three. However, rapid transit would have a higher average number of passengers per station than either light rail or bus because of more total passengers using fewer stops. These factors are tabulated in Table 9.16. Because of this characteristic, rapid transit would be more likely to create commercial development at intermittent nodes (a policy favored by the B.R.A. - see Chapter 2) rather than a linear arrangement of commercial development.

TABLE 9.16

PASSENGERS PER STATION FOR SPECIFIC ALTERNATIVES

<u>Alternative</u>		<u>Daily Riders</u> ¹	<u>Number of</u> ² <u>Stations</u>	<u>Average Riders</u> <u>Per Station</u>
1	Light Rail	21,400	20	1,070
2	Light Rail	23,600	19	1,240
3	Light Rail	25,000	19	1,310
4	Light Rail	36,300	28	1,300
5a.	Rapid Transit	25,200	9	2,800
b.	Light Rail	4,600	6	770
6.	Busway	20,800 ³	19	1,100
7a.	Light Rail	14,600	11	1,330
b.	Commuter Rail	5,000	9	550
8	Rapid Transit	28,100	12	2,340
9a.	Light Rail	22,500	16	1,400
b.	Bus ⁴	3,600	11	330
10	Bus	-	-	-
11a.	Rapid Transit	28,700	12	2,390
b.	Light Rail	14,600	23	630

Notes

- 1 See Table 9.10
- 2 See Appendix E
- 3 Only passengers boarding on busway itself
- 4 Riders on new service cannot be tabulated separately from current users

Permanence of service is related primarily to the capital investment required for implementation. Using this measure, a hierarchy of modes could be set up as follows:

1. Rapid transit (highest)
2. Light rail
3. Busway
4. Commuter rail
5. Local bus (lowest)

However, it should be noted that even local bus routes, which theoretically are completely flexible to respond to changing demand, are not often changed. In fact, most of the local buses in the study area use the same routes as streetcars of the late 19th and early 20th century.

In terms of alignment, the previous analysis of service to major centers (Section B-2) indicates the relative merits of the alternatives in developing existing commercial nodes. Development impacts along various alignments between these centers were examined for the various zones of service (see page 9.2).

All transit alternatives in Zone 1 have the same alignment on Washington Street through the South End. In Zone 2 (Roxbury), five potential alignments were used in various specific alternatives as follows:

1. Washington/Seaver Streets (Alt. 1 and 11)
2. Warren Street (Alt. 2, 4, 6, 7, 8, 11)
3. Blue Hill Avenue (Alt. 2, 4, 6, 7, 8, 11)
4. Midland Railroad (Alt. 3, 5, 7, 9)
5. Columbia Road (Alt. 11)

A new service on Washington Street south of Dudley would help stimulate development along this corridor which is now marginal because of the negative impact of the elevated structure and the large distance between Dudley and Egleston Stations. On the other hand, new development on Washington Street might be difficult to attract because of its close proximity to the relocated Orange Line corridor, its primarily residential character and overall limitations on the demand for commercial development in the area.

Warren Street has been experiencing economic recovery for the past three years. New transit service could enhance present recovery efforts, especially for the visibility it could provide to stores along the street. Blue Hill Avenue has experienced severe abandonment and has been proposed for upgrading as part of the City's Boston Plan (see Chapter 2). New transit would help reinforce the viability of the plan.

The Midland Branch Railroad runs mostly near residential areas, except for the commercial areas at Uphams Corner, Morton Street, Woodrow Avenue and Talbot Avenue. Space and incentive for commercial development at most locations along the Midland Railroad is somewhat limited, when compared to Blue Hill Avenue. Development similar to that along the MBTA Riverside line could be expected along the Midland Railroad with some station areas having local commercial development while others primarily support residential uses.

Columbia Road is a commercial/residential strip with mostly marginal business activity except at the major nodes of Uphams Corner or Grove Hall. Transit service on this alignment could help upgrade the viability of development.

In Zone 3, two alignments are possible: the Midland Railroad and Blue Hill Avenue. The preceding analysis of the Midland Branch north of Grove Hall would also apply generally to the area south of Grove Hall. Commercial activity on Blue Hill Avenue south of Grove Hall is somewhat limited with high vacancy rates, except at Mattapan Square (see Table 2.3). A transit system on this alignment could help improve the viability of commercial development.

In Zone 4, the crosstown links proposed in Alternatives 4 and 11 would help improve the viability of proposed residential, commercial and recreational development at Columbia Point (Boston Plan) in addition to serving UMass and the Kennedy Library. It would also help improve the importance of the Uphams Corner commercial center and aid redevelopment along Dudley Street.

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**SOUTH END
DORCHESTER**

**ROXBURY
MATTAPAN**

10

**Selection of
Alternatives for Phase II**

CHAPTER 10 SELECTION OF ALTERNATIVES FOR PHASE II

INTRODUCTION

Historically, the "replacement" aspect of the Replacement/Transit Improvement Study was the result of a commitment to evaluate the effects of relocating the existing elevated Orange Line on Washington Street and provide a substitute service where needed. "Transit improvement" was meant to apply to other sections of the study area not presently served by the elevated. This does not imply that whatever recommendations are made for replacement service would not also constitute a transit improvement. In this context, some sections of the study area can be clearly identified as requiring either "replacement service" or to be in need of "transit improvements", while recommendations for other sections can best be made using a combination of the two concepts.

On this basis, four zones of service were defined. Zone 1 - South End to Dudley Square, encompassing an area equidistant from Washington Street - is the one most affected by the relocation of the Orange Line and is therefore the zone in which replacement service must be evaluated. Zone 2 - Dudley Square to Grove Hall - identifies a section of the study area requiring evaluation of both concepts since it is affected on the west by the relocation of the Orange Line and is presently served on the east and south by a network of feeder buses. Zone 3 - Grove Hall to Mattapan Square - is presently served by a network of feeder buses to the Orange and Red Lines and would benefit from an evaluation of improved means of public transportation. Similarly, the travel needs of residents in Zone 4 - Columbia Point to Northeastern University, which is part of a primary corridor for crosstown service - would be better met through improved access between the neighborhoods at either end of the zone.

The diverse needs and requirements in the zones gave rise to a large number of possible combinations. The analysis in Chapter 9 helped to make this number more manageable. Evaluation of the eleven specific transit alternatives (pp. 9.27 - 9.54) generated information which was used to identify elements of transit alternatives for further analysis in Phase II of the Study. First, determination was made of which modes should be analyzed further in Phase II. Then, the specific alternatives for each surviving mode were compared in each of the four zones of service, to see which alignments should be analyzed in Phase II. The end result was a series of modes and alignments in each zone of service recommended for Phase II. At the same time, a number of modes and alignments are being dropped.

Phase I analysis has identified a number of modes and alignments which are accepted by the community and can meet the transportation needs of residents in each zone of the study area. Phase II analysis will concentrate on issues such as: detailed engineering analysis of pedestrian movement and safety, community preference, determination of the cost and feasibility of right-of-way acquisition, and impact on traffic on city streets and current transit operations. Analysis of these factors will indicate preferred alignments and modes in each zone of service. These alignments and modes will be combined into a small set of viable "alternatives" for the whole study area (consisting of modes and alignments in each zone, compatible with modes and alignments in all other zones) and detailed analyses of ridership, safety, community preference, environmental impact, construction costs, staging, etc., will be made. A single preferred alternative system will then be selected.

ANALYSIS OF TRANSIT MODES

Table 10.1 compares the four modes (busway, light rail, commuter rail and rapid transit) used as parts of the specific alternatives in terms of the evaluation criteria shown in Table 1.1, namely: user benefits, environmental impacts, land-use and developmental impacts, and cost-effectiveness factors. Three of the modes are recommended for further analysis in Phase II: busway, light rail and commuter rail. Rapid transit is not recommended for further analysis and commuter rail can only be viewed when combined with other modes. The following paragraphs amplify the basis for the recommendations.





Busway and Light Rail

The cost effectiveness factors given in Table 10.1 indicate that busway and light rail modes are clearly more cost-effective than commuter rail and rapid transit. Specific problems associated with pedestrian movement and safety and property acquisition caused by either buses or light rail on a median reservation will be addressed in Phase II when the alternatives are examined in more engineering detail. These problems could be overcome by proper median design and/or tunneling where required.

Busway alternatives could also include trackless trolley, which has superior characteristics in terms of noise and air pollution than standard diesel buses. However, the overhead wire requirements for the trackless trolley make it less desirable in terms of cost and aesthetic impact in residential neighborhoods and downtown Boston. In Phase II, trackless trolleys will most likely be examined for a connecting service (as in Alternative 9) rather than as the combined collector-line haul type service outlined in specific Alternative 6. Consideration will be given to the availability of maintenance facilities for trackless trolleys in the study area.

TABLE 10.1

COMPARISON OF TRANSIT MODES

Vehicle Type	Transportation Service – User Benefits	Environmental Impact	Land Use/ Land Development Impact	Cost-Effectiveness Factors			
				Capital Cost	Cost/ Rider	Cost/ New Rider	Cost/ Travel Time Savings Ratio
 RAPID TRANSIT/ SUBWAY CAR (In Tunnel or on Railroad Line)	Fastest service to downtown Minimal disruption to surface traffic Best potential schedule adherence Longest probable implementation Causes split service on Orange Line Wide station spacing	Limited required land takings except at stations Greatest potential construction disruption	Could provide major incentive to development in vicinity of stations	\$315-637 million	\$1.70-3.00	\$13.50-18.60	6.7-11.2
 RAILROAD (On Railroad Line)	Does not replace Orange Line service Needs other improvements Good potential schedule adherence Capacity problems at South Station High comfort rating Poor transfer capability Potential quick implementation Least impact on surface traffic Wide station spacing	Least required land takings Minimal construction disruption	Minimal stimulus to development	\$16-32 million	\$0.90-1.30	\$11.70-18.60	4.4-7.0
 STREETCAR/LIGHT RAIL VEHICLE (LRV) (In Tunnel in Median or on Street)	Best downtown and Back Bay connections Good potential for incremental construction Potential disruption to surface traffic Frequent station locations	High potential land takings on narrow existing streets High potential for construction disruption	Could provide incentive for development along major streets	\$82-202 million	\$0.60-1.30	\$4.00-9.20	2.9-6.9
 BUS (In Median or on Street)	Best transit coverage Best potential to minimize transfers Worst potential schedule adherence Potential quick implementation Potential disruption to surface traffic Good potential for incremental construction	Greatest source of air pollution and noise of transit modes on the street	Lesser investment in fixed facilities provides less incentive for development	\$5.7-14.3 million	\$0.50	\$2.40-2.90	2.4-2.7

Phase II of the study will look at light rail options both above and below ground. Underground sections for light rail lines will be considered where surface-running systems are not appropriate. Tunnel sections will be considered in areas where right-of-way is limited and property taking is not desirable (such as in the South Cove area, on Warren and Dudley Streets, and in the Mattapan Square area) and surface systems may cause major conflicts with pedestrian safety and/or vehicle movements (such as specific locations on Blue Hill Avenue south of Grove Hall).

Because of ventilation problems, all busway alternatives must run above-ground. However, tunnel sections for a trackless trolley are possible.

Commuter Rail

Commuter rail alone cannot provide replacement service for the Orange Line in the South End and Roxbury communities, and therefore, would have to be implemented in conjunction with other modes to create a viable transportation alternative for the corridor. In addition, its traditional operating characteristics are not necessarily well-suited to study area needs for high frequency, low-fare transportation. However, this mode can be implemented quickly and inexpensively and, in conjunction with other modes, satisfy the area's travel needs. In the long run, commuter rail service possibly could be upgraded through electrification and by providing service to downtown Boston and North Station as part of the proposed Central Artery reconstruction project. Therefore, it is recommended as an option for further analysis in Phase II.

Rapid Transit

It is recommended that all rapid transit alternatives be eliminated prior to Phase II. The analysis documented in Chapter 9 has shown that persons in the study area can realize greater benefits from a more extensive network of light rail, busway and/or commuter rail lines than from a single rapid transit line; and at far less overall cost.

Although rapid transit costs far more than other modes in the study area, such cost might be justified if significantly greater benefits to study area residents could be achieved. Traditionally, benefits of rapid transit have included the following:

- (1) greater passenger-carrying capacity
- (2) faster travel speeds
- (3) less disruption to vehicular traffic (after construction)
- (4) best potential for spurring development
- (5) most reliable

Each factor was discussed previously in Chapter 9. The conclusions are summarized here:

(1) Passenger-Carrying Capacity - Although rapid transit does provide greater passenger carrying capacity than light rail or busway, rider forecasts have shown that any foreseeable passenger demand can be served by either of the latter modes. Projected maximum peak hour demand under any mode option of 4,000-4,500 passengers (see page 9.31) can be accommodated in 2-3 car light rail vehicles or in buses in the busway. The busway has lesser capacity to handle large increases in demand, but could be converted to a light rail line if and when greater capacity is required.

(2) Travel Speed - Rapid transit can provide faster service to downtown Boston from stations along the route than do other modes. However, travel time between all stations and downtown for light rail and busway systems can be made reasonably comparable to rapid transit if maximum use of exclusive right-of-way is made, stations are spaced at least 1/4 mile apart and traffic preemptive signals are used. A single rapid transit line provides walk-in service only near stations which are spaced further apart than light rail or busway while other potential riders would take feeder bus service to get to a station, and most would find it equally convenient to take a bus to either the Orange or Red Lines. Actual door-to-door travel times for all users would benefit more from greater coverage of the study area by either busway or light rail lines. (See Table 9.11 - Analysis of Travel Time Savings)

(3) Less Disruption to Vehicle Traffic - Surface light rail or busway systems not on a separated R.O.W., like the Midland Railroad, take up part of the street right-of-way and, therefore, reduce traffic carrying capacity. Rapid transit, which must be completely grade separated, only disrupts traffic during the construction period (although such a period is lengthy) because it tunnels under city streets. The long-term disruption of surface systems (such as busways or light rail in a median reservation) can be mitigated through proper design and use of grade-separation when required and may actually be beneficial in some areas where policy is to discourage through traffic.

Pedestrian movement and safety problems associated with surface systems must be resolved through either proper design of the median or by tunnel sections where needed.

(4) Potential for Development - While rapid transit may provide somewhat greater stimulus to development than other modes, primarily around stations, this factor does not have to be significant if proper land planning accompanies development of other transit modes. Development in Brookline at Coolidge Corner and along Beacon Street are examples of the possible impacts of light rail. In addition, the tunneling requirements for rapid transit may potentially harm preservation efforts in areas like the South End and would definitely be much more disruptive during the longer construction period.

(5) Reliability - Rapid transit in a subway would provide potentially more reliable service than surface modes, but only for those persons able to walk-in (a smaller number than on busway or light rail alternatives). Others would still have to transfer from local buses.

Weighted against these marginal benefits, rapid transit has some real disadvantages. It splits service on the relocated Orange Line which will reduce train frequency to the Southwest Corridor communities of Roxbury and Jamaica Plain. While the engineering requirements for a branch at either South Cove or Ruggles have not been explored in detail, it appears that large and very complicated structures would have to be provided in these areas to effect a branch. Construction of a subway on Washington Street or in the South End would have to await dismantling of the elevated and entail a service gap of at least 4 to 5 years.

A single line rapid transit system would benefit an area without any downtown-oriented rail transit system in place. However, the study area already has both Orange and Red Lines on its periphery. In this case, a system which can collect and distribute riders over a greater area with more closely spaced stations would provide better coverage and greater user benefits. Table 10.2 shows this by comparing a light rail alternative having both radial and crosstown service (Alternative 4) to rapid transit alternatives, Alternatives 5 and 8. A similar comparison could be made for the busway alternative.

Table 10.2 indicates that the dual network of light rail lines (Alt. 4) provides from 20% to 100% in greater benefits over rapid transit alternatives in terms of increased ridership (due in part to better coverage) savings in travel time and reduction of automobile travel. Yet, its capital cost and total annual cost is far lower. This clearly indicates that the cost to construct and operate a single rapid transit line in the study area could be spent more effectively in creating a network of light rail and/or busway lines.

TABLE 10.2

COMPARISON OF SELECTED LIGHT RAIL AND RAPID TRANSIT ALTERNATIVES

<u>Factor</u>	<u>Reference Table</u>	<u>Alt. 4 (LRV)</u>	<u>Alt. 5 (R.T.)</u>	<u>Alt. 8 (R.T.)</u>
Daily New Riders	9.10	7,550	3,740	4,490
Daily Riders	9.10	36,300	29,800	28,100
Daily Travel Time Savings (Hours)	9.11	6,790	4,970	4,970
Daily Reduction in Auto Travel (Miles)	9.15	85,300	44,500	55,700
Capital Cost (millions 1977 \$)	9.8	161-202	315	637
Annual Cost (millions 1977 \$)	9.9	17.9-20.5	29.8	50.1
Cost Per Rider (1977 \$)	9.12	0.80-0.90	1.70	3.00

For all these reasons, it does not appear productive to continue analysis of rapid transit into Phase II. The time and effort spent analyzing this mode could be spent more productively in working out details and evaluating alignments for other modes.

ANALYSIS OF ALIGNMENTS

The alignments for bus and light rail modes were evaluated within each specific zone of service. As outlined in Chapter 9, the zones of service correspond to the four basic areas of study:

- Zone 1 South End to Dudley Station
- Zone 2 Dudley Station to Grove Hall
- Zone 3 Grove Hall to Mattapan
- Zone 4 Crosstown (Northeastern to Columbia Point)

Examination of the specific alternatives indicated that many viable overall transportation systems could be made up from the preferred alignment or alignments within each zone. Therefore, it was imperative to select the most feasible alignments within each zone prior to entering

Phase II and then to reduce options further in Phase II on the basis of detailed analysis. Subsequently, complete transit systems consisting of a series of alignments in each zone could be created for system-wide analysis.

The following describes those alignments dropped and those recommended for study in Phase II, and presents some of the critical issues in each zone of service that will be analyzed in Phase II to determine a preferred alternative.

Zone 1 - South End to Dudley Station

Table 10.3 shows potential modes and alignments in Zone 1 and recommendations for Phase II.

TABLE 10.3
ZONE 1 RECOMMENDATIONS

<u>Mode</u>	<u>Alignment</u>	<u>Recommendation</u>
Busway (Trackless Trolley)	Washington Street	Study in Phase II
Light Rail	Washington Street	Study in Phase II
Rapid Transit	Washington Street	Drop prior to Phase II (see page 10.4)

Washington Street is the most feasible alignment in Zone 1 because of width and central location. Two modes should be examined in Phase II: a light rail service in a median reservation which ties into the Green Line at Boylston Station, and a busway running in a median reservation which ties into the City's proposed Auto Restricted Zone in the downtown shopping district. The busway could use either standard bus or, if feasible, trackless trolley modes.

Some of the more important issues which will be addressed in Phase II in order to select a system for Zone 1 are listed below:

1. Light rail portal location and alignment in the South Cove area (continuation of the analysis in Chapter 8).
2. Impact on downtown environment of greatly increasing the number of buses entering the proposed Auto Restricted Zone (ARZ).
3. Impact of increased bus volumes on traffic operations in the ARZ (continuation of analysis in Appendix F).
4. Solution of R.O.W. problems in Cathedral area.
5. Impact of surface transit on traffic signalling, left turns and pedestrian crossings throughout the South End.

6. Transit operations and impact on other lines in Green Line Subway at Boylston Station.
7. Impact of surface transit on current traffic volumes and patterns in the South End and at Dudley Square.
8. Potential for new commercial development along Washington Street.
9. Full or partial construction of replacement service prior to demolition of elevated structure.
10. Space for turning back light rail vehicles, buses and track-less trolleys at Dudley Station.

Zone 2 - Dudley Station to Grove Hall

Table 10.4 shows potential modes and alignments in Zone 2 and recommendations for Phase II.

TABLE 10.4
ZONE 2 RECOMMENDATIONS

<u>Mode</u>	<u>Alignment</u>	<u>Recommendation</u>
Busway	Warren Street	Study in Phase II
	Blue Hill Avenue	Study in Phase II
	Seaver Street	Study in Phase II
Light Rail	Washington Street	Drop prior to Phase II
	Warren Street	Study in Phase II
	Blue Hill Avenue	Study in Phase II
	Midland RR	Study in Phase II
	Seaver Street	Drop prior to Phase II
	Columbia Road	Drop prior to Phase II
Rapid Transit	Warren Street	Drop prior to Phase II
	Midland RR	Drop prior to Phase II (See page 10.4)
Commuter Rail	Midland RR	Study in Phase II

Busway alignments for downtown-oriented service are possible on either Warren Street or Blue Hill Avenue. Because land taking would be undesirable on Warren Street south of Quincy Street where right-of-way is limited, and bus tunnels are not practical, it is likely that all busway options would run on Blue Hill Avenue in this area.

Subsequent to the development of specific alternatives discussed in Chapter 9, a proposal was made to evaluate a busway on Seaver Street that would provide connections from Blue Hill Avenue to the Jackson Square Station on the Relocated Orange Line. This busway could be part of an overall crosstown bus route running from Ashmont Station on the Red Line to the Brookline Village Station of the Riverside (Highland) Branch of the Green Line. This would be routed as follows:

Ashmont Station - Blue Hill Avenue:	Talbot Avenue
Talbot Avenue - Seaver Street:	Blue Hill Avenue
Blue Hill Avenue - Egleston Square:	Seaver Street
Egleston - Jackson Square:	Columbus Avenue
Jackson Square - Brookline Village:	Heath Street - Huntington Avenue

This routing is shown in Figure 10.1 and it is recommended that it be studied further in Phase II.

Light rail alternatives are recommended for further study along Warren Street, Blue Hill Avenue and Midland Railroad segments, but not on the Washington - Seaver and Columbia Road segments. The Washington - Seaver Street alignment was used in Specific Alternatives 1 and 11 while the Columbia Road alignment was used in Alternative 11.

The Washington - Seaver alignment was compared to Warren Street/Blue Hill and Midland Railroad alignments by examining data for specific Alternatives 1, 2 and 3 which use the three alignments for light rail from Mattapan to downtown Boston. A reiteration of cost-effectiveness factors for these three alignments is given in Table 10.5 below. Note that all factors consider the entire alignment - not just the section in Zone 2.

TABLE 10.5
COST-EFFECTIVENESS FACTORS FOR SELECTED
LIGHT RAIL ALIGNMENTS

Spec. Alt.	Alignment in Zone 2	Vertical Alignment	Capital Cost (\$ Millions)	Cost per Rider		Ratio of Cost to Travel Time Savings*
				New	Total	
1	Washington-Seaver	At-grade	85	4.3	0.7	3.8
		Partial Tunnel	189	7.8	1.3	6.9
2	Warren/Blue Hill	At-grade	84	4.2	0.7	3.0
		Partial Tunnel	125	5.3	0.9	3.8
3	Midland RR	At-grade	82	5.1	0.6	3.4
		Partial Tunnel	188	9.2	1.1	6.2

*The lower the ratio, the more advantageous the alignment, i.e., lower cost or greater travel time savings.

Table 10.5 indicates that the range of cost-effectiveness factors is fairly similar for specific alternatives 1 and 3. However, because of extensive abandonment, property takings on Dudley Street appear more feasible than on Washington Street south of Dudley Station. This fact makes the at-grade profile of Alternative 3 more likely for implementation than that of Alternative 1. Consequently, the numbers which realistically should be compared are factors for a partial tunnel in Alternative 1 against the two profiles (at-grade or in partial tunnel) in Alternative 2 and the at-grade profile in Alternative 3.

This comparison proves unfavorable to Alternative 1, because of its high capital cost and slightly lower ridership and savings in overall travel time. The lower ridership and travel time savings result from its proximity to the relocated Orange Line, particularly in the Egleston Square area.

The principal advantage of the Washington-Seaver alignment is that it directly serves the Egleston area which now has an Orange Line station. However, this area will also be served well by the relocated Orange Line at Jackson Square Station which is only 1/2 mile away and will have feeder bus service. Currently, 65 per cent of passengers using the Orange Line at Egleston Station arrive by either bus or automobile (see Table 3-10 in Appendix B). In addition, the new Boylston Street Station is only 1/3 mile away from Egleston Square.

Warren/Blue Hill and Midland Branch alignments provide a more central location between Orange and Red Lines in the Roxbury, Uphams Corner area than the Washington-Seaver alignment. These alternatives have been retained because each has advantages and disadvantages which should be investigated further in Phase II before decisions can be made. The Midland Railroad is attractive for rail modes because it provides an exclusive grade-separated alignment which means lower construction costs and faster and more efficient transit operations. Although both Warren Street and upper Blue Hill Avenue alignments have some right-of-way constraints, each offers centrally-located service to Roxbury and opportunities for development.

The Columbia Road alignment closely parallels the Midland Railroad. It generally contains right-of-way sufficient to meet minimum requirements for a median reservation, except for a 600 foot section near Uphams Corner. However, accommodating current traffic volumes on Columbia Road may require a minimum of two travel lanes in each direction and consequently require land takings or tunnel construction. Unlike the Warren Street and Blue Hill Avenue alignments which roughly parallel each other and where it might be possible to divert traffic from one arterial to another if a transit median were constructed, Columbia Road has no parallel arterial for diversion of through traffic.

The primary reason for eliminating Columbia Road as an alignment for light rail or busway is that it serves only a limited transportation purpose. It connects Uphams Corner and Grove Hall but, unlike the Midland Railroad, does not serve as a potential link between the study area and downtown. As part of Alternative 11, it attracted only 1,800 daily riders (one-way trips), which is a volume that can adequately be handled by local bus service. In summary, Columbia Road does not provide a needed link for a possible light rail or busway system from Grove Hall or Dorchester to downtown, nor does it stand on its own as more than a local bus link. Therefore, it should not be included in Phase II analysis.

Major issues addressed in Phase II for Zone 2 will include:

1. Problems of limited R.O.W. in Grove Hall and on lower Warren Street.
2. Potential for using transit as a stimulus for redevelopment of Blue Hill Avenue as outlined in the Boston Plan.
3. The relative benefits of upgrading an improving street (Warren Street) as opposed to a street which has experienced considerable abandonment (Blue Hill Avenue).
4. The vertical and horizontal alignment of a light rail connection between Dudley Street and the Midland Railroad.
5. Organization of vehicular traffic through the Dudley Station area.
6. Alignment of transit systems through the Dudley Station area.
7. Potential joint development at Dudley Square.
8. Availability of R.O.W. for a busway segment between Blue Hill Avenue and Warren Street.
9. Trolley or bus turn back capability at Grove Hall or at Zoo.
10. Connection to the Crosstown Street (direct routing, station locations).

Zone 3 - Grove Hall to Mattapan

Table 10.6 indicates the alternatives considered and recommendations for the Zone 3 area.

All Zone 3 light rail and bus alternatives studied in Phase I are recommended for retention in Phase II of the study. Two light rail alignments are possible in the southern zone: the Midland Railroad or Blue

TABLE 10.6

ZONE 3 RECOMMENDATIONS

<u>Mode</u>	<u>Alignment</u>	<u>Recommendation</u>
Busway	Blue Hill Avenue	Study in Phase II
	Talbot Avenue	Study in Phase II
Light Rail	Blue Hill Avenue	Study in Phase II
	Midland RR	Study in Phase II
Rapid Transit	Blue Hill Avenue	Drop prior to Phase II
	Midland RR	Drop prior to Phase II (See page 10.4)
Commuter Rail	Midland RR	Study in Phase II

Hill Avenue. The Midland Railroad has advantages in terms of cost, travel speed, and transit operations, and is centrally located to serve the residents of the area. Blue Hill Avenue has sufficient right-of-way south of Grove Hall for either busway or light rail options. Transit on Blue Hill Avenue would help upgrade already existing commercial development.

A possible busway segment on Talbot Avenue from Ashmont Station to Blue Hill Avenue is also recommended for further analysis. This segment is part of the crosstown system previously described in the section on Zone 2.

Phase II analysis will concentrate on the following major issues in Zone 3:

1. Opposition by some citizens to transit improvements other than local bus service on Blue Hill Avenue.
2. Revitalization of Blue Hill commercial areas vs. Midland Railroad's more centralized location.
3. Vertical and horizontal alignment for the light rail connection between Blue Hill Avenue and the Midland Railroad near Mattapan Square (at Simco's).
4. Transit alignments in the Mattapan Square area.
5. Potential for connecting light rail service to the Ashmont-Mattapan high-speed line.
6. Extension of commuter rail service to Hyde Park and Readville.

7. Need for a third track for freight or Amtrak service on the Midland Branch Railroad.
8. Traffic and safety considerations if a median reservation is put on Blue Hill Avenue.

Zone 4 - Columbia Point to Northeastern

Potential modes for the crosstown alignment (Zone 4) are shown in Table 10.7.

TABLE 10.7
ZONE 4 RECOMMENDATIONS

<u>Mode</u>	<u>Alignment</u>	<u>Recommendations</u>
Busway	Dudley Street	Study in Phase II
Light Rail	Dudley Street	Study in Phase II
Rapid transit	Dudley Street	Drop prior to Phase II (See page 10.4)

Analysis of specific alternatives 4 and 11 showed that a crosstown link from Columbia Point through Uphams Corner and Dudley to the Fenway area could generate considerable new transit ridership. Although only the light rail mode was examined as a specific alternative, the general cost-effectiveness of a busway elsewhere suggests that it also be studied in Phase II. A rapid transit crosstown alignment was not examined as a specific alternative and the mode's lack of cost-effectiveness (particularly in a crosstown alignment where a complete subway would be required) suggests that it be dropped prior to Phase II. No community interest has been expressed for rapid transit on the crosstown alignment.

The Dudley Street alignment was analyzed for crosstown service in Phase I and is ideal in terms of transportation. Its right-of-way is constricted throughout, although property acquisition may be possible along most of its length. However, widening the street in some areas such as Uphams Corner may be undesirable, leading to either tunnelling (not feasible for bus alternative) or utilizing other streets in the area. Consequently, Phase II analysis should also examine other potential parallel alignments in Zone 4.

Zone 4 issues addressed in Phase II will include:

1. Limited right-of-way on Dudley Street
2. Making the crosstown LRV a branch of the Arborway Line or a shuttle to the relocated Orange Line.
3. Potential for extending the crosstown line to provide circumferential service to the Fenway and possibly Cambridge and Somerville as proposed in the BTPR report.
4. Impact of crosstown transit on Columbia Station of the Red Line.
5. Conversion of line from bus to light rail over a period of time.
6. Specific R.O.W. problems at Uphams Corner.
7. Potential capacity problems at Copley Junction in the Green Line Central Subway if new light rail service is added to the Arborway Line.
8. Interface with institutions and proposed development at Columbia Point.
9. Whether a crosstown link should run into the Dudley Station area or north of Dudley on the crosstown street.
10. How crosstown service interfaces with radial service.
11. The feasibility of operating another branch of the Arborway Line.
12. Alignment required to cross the Southeast Expressway to reach Columbia Point.

OVERALL RECOMMENDATIONS AND PHASE II PROCEDURE

Transit alignments and modes recommended for Phase II in all four zones of service are shown in Table 10.8 and Figure 10.1. Those alignments and modes dropped during Phase I are listed in Table 10.9.

Some of the alignments and modes shown in Figure 10.1 and Table 10.8 may be found clearly unfeasible when more detailed engineering work is performed as part of Phase II. Those alignments or modes still remaining will be combined into service packages for detailed analysis of ridership, environmental impact, construction costs and staging, etc. An Environmental Impact Statement will then be developed for all viable alternatives. A public hearing on the preferred transit system will subsequently be held.






TABLE 10.8

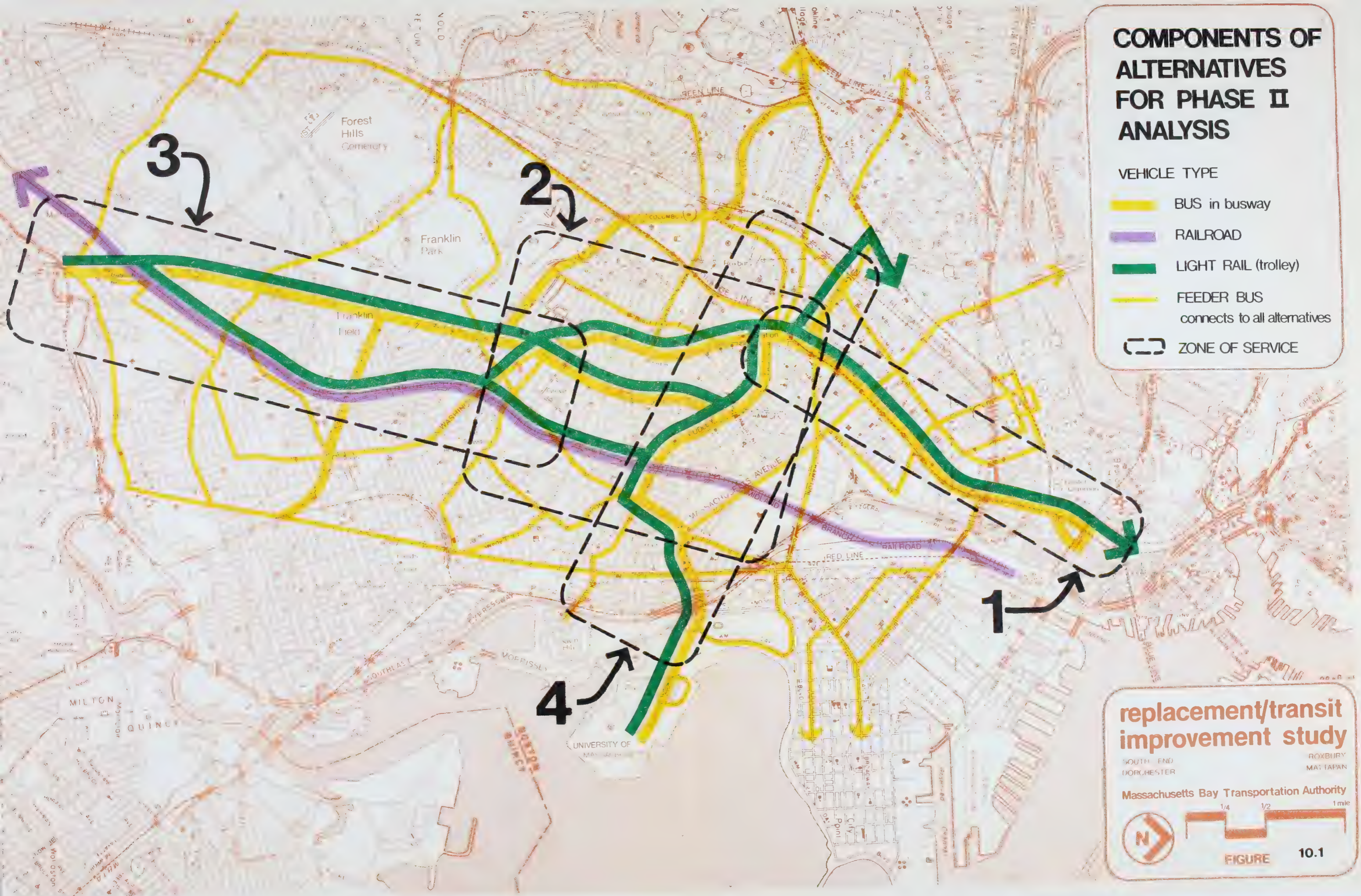
SUMMARY OF RECOMMENDED ALTERNATIVES

Zone of Service	Impacted Area	Alignment (Routes)	Mode (Vehicle Type)				Remarks
			BUS	LIGHT RAIL VEHICLE	RAILROAD	RAPID TRANSIT	
			Exclusive Right of way	Exclusive Right of way	Exclusive Right of way	Exclusive Right of way	
			Destination				
			Downtown Shopping District	enters Green Line at Boylston or Huntington	South Station	Orange Line at Ruggles or So. Cove	
1	South End to Dudley Station	Washington Street	*	*			<ul style="list-style-type: none">loses transit service as Orange Line is relocatedWashington St. most feasible—wide and centrally located in zone
2	Dudley Sq. Grove Hall Mt. Bowdoin Uphams Corner	Blue Hill Avenue	*	*			<ul style="list-style-type: none">limited right of waycentrally located in zone
		Warren Street	*	*			<ul style="list-style-type: none">opportunities for development
		Midland Railroad		*	*		<ul style="list-style-type: none">exclusive grade-separatedlower cost
		Seaver-Columbus	*				<ul style="list-style-type: none">provides crosstown service
3	Franklin Field Mattapan	Blue Hill Avenue	*	*			<ul style="list-style-type: none">stimulates business area
		Midland Railroad		*	*		<ul style="list-style-type: none">exclusive grade-separatedlower costcentrally located in zone
		Talbot Avenue	*				<ul style="list-style-type: none">provides crosstown service
4	Northeastern University Dudley Sq. Uphams Corner Columbia Pt.	Crosstown St. Wash. St. Dudley St. Columbia Pt.	*	*			<ul style="list-style-type: none">right of way is limitedgenerates greatest number of new transit riders
<div><div>*</div> Recommended Transit Segments</div> <div><div></div> Segments Not Recommended</div>							

COMPONENTS OF ALTERNATIVES FOR PHASE II ANALYSIS

VEHICLE TYPE

-  BUS in busway
-  RAILROAD
-  LIGHT RAIL (trolley)
-  FEEDER BUS
connects to all alternatives
-  ZONE OF SERVICE



replacement/transit improvement study

SOUTH END
DORCHESTER

ROXBURY
MATAPAN

Massachusetts Bay Transportation Authority

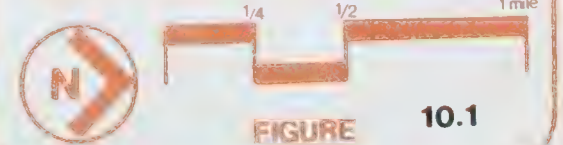


FIGURE 10.1

TABLE 10.9

SUMMARY OF DROPPED ALTERNATIVES

<u>Stage in Phase I</u>	<u>Alternative Dropped</u>		Report Reference (Page)*
	<u>Mode</u>	<u>Alignment</u>	
Technology Analysis	PRT	--	7.13
	Dual-Mode	--	7.14
	Monorail	--	7.14
Prior to analysis of generalized alternatives	All modes on elevated structure	--	9.7
	Busway in tunnel	--	9.7
	Busway	Midland RR	9.7
After analysis of generalized alternatives	Light rail in tunnel	--	9.16
	Exclusive curb bus lane	--	9.17
	Light rail in street traffic	--	9.20
	Rapid transit	Midland RR north of Uphams Corner	9.19
	Light rail	Midland RR - north of Uphams Corner	9.19
After analysis of specific alternatives	Rapid transit	All alignments	10.4
	Light rail	Washington-Seaver	10.11
	Light rail	Columbia Road	10.11

* The page shown indicates the location where the reasons for not recommending the alternative for further analysis in Phase II are discussed.

replacement/transit improvement study

**SOUTH END
DORCHESTER**

**ROXBURY
MATTAPAN**

Appendices

APPENDIX A: MINUTES OF MEETINGS AND COMMUNITY COMMENTS

PROJECT WORKING COMMITTEE MEETINGS

<u>Page</u>	<u>Date</u>	<u>Location</u>	<u>Major Agenda Item</u>
A.2	April 5	Site Office, Roxbury	Identification of Transit Alternatives
A.7	May 10	Site Office, Roxbury	Talks by Sec'y of Transportation Frederick Salvucci and BRA Director Robert Walsh
A.13	May 24	Site Office, Roxbury	Generalized Alternatives
A.18	June 28	Charles Drew Family Life Center, Grove Hall	Analysis of Current Transit Service
A.22	July 26	Roxbury Multi-Service Center, Roxbury	Selection of Alternatives for Analyzing Transit Rider Survey Results; Short-Term Improvements
A.28	September 14	Shelburne Recreation Center, Roxbury	Update on Transit Alternatives, Short-Term Improvements
A.34	October 26	Boston City Hospital South End	Phase I Recommendations
A.45	January 31, 1978	Prince Hall Masonic Lodge Grove Hall	Phase I Report, Phase II Recommendations

Note: PWC meetings held in March, 1977 were introductory, and comprehensive notes were not published.

A.55 MINUTES OF PROJECT COORDINATION MEETINGS

A.105 COMMENTS ON PHASE I RECOMMENDATIONS

WORKING COMMITTEE

MINUTES OF MEETING NO. 1

DATE: April 5, 1977
PLACE: 90 Warren Street, Site Office
TIME: 7:35 to 10:15 P.M.
PRESENT: Please see attached

1. Peter Calcaterra began the meeting by introducing himself and having everyone attending introduce themselves and their agency affiliation or neighborhood.
2. Peter went on to indicate that the project would lead to an evaluation of a series of alternatives. He briefly described the scope of the study.
3. During the project description a question was raised about the definition of "fixed guideway". Peter indicated that it referred to a trolley line or other rail transit vehicle. It was indicated during the discussion that the study would develop five to six alternatives in Phase I which would then be narrowed down to a preferred alternative in Phase II. Peter indicated that the preferred alternative might be a package of more than one improvement.
4. Another technical term used during the discussion, unfamiliar to some of the participants, was "modes". The definition given for this term was the various ways people travel, by bus, trolley, train, subway, etc.
5. Alf Howard of the BRA raised the question about the dollar commitment that is available for construction of the final solution that the Study develops. He indicated that \$25 million was allocated for the South End portion, which was based on a light-rail surface vehicle operation. He indicated that \$125 million is allocated for the Dorchester/Mattapan/Roxbury replacement construction. Ken Kruckemeyer said that this funding comes from the area's Program for Mass Transportation (PMT) which estimated total money estimated for the area's transport needs but was not necessarily a commitment.
6. Ken Kruckemeyer discussed Interstate Transfer funds in relation to the project. He stated that we may or may not use that money for the ultimate construction of the project and that other funds may be used in lieu of those funds.

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7. Bill Kuttner suggested that the Committee might look at innovative systems because of the orientation of grant moneys that are available. He gave an example of Personal Rapid Transit vehicles (PRT) as one possibility for a demonstration grant application.
8. One of the Committee members asked that a definition for PRT be given. The definition given was of a small vehicle carrying 4-8 people that would give more personalized service than typical mass transit.
9. Dee Prim referred to a letter from Governor Sargent's administration which gave a commitment to the community to tear down the elevated line and replace it with something better.
10. This generated a discussion about the need for a governmental pronouncement to get people to understand the importance of the Study. It was suggested that the Governor or at least Secretary Salvucci make a statement emphasizing the importance of the Study. This would not only add credibility to the Study but also would increase the effectiveness of the Community Liaison Team and the Working Committee.

If the Press covered the Governor's statement, then the people would become aware of the project. The possibility of Mr. Salvucci or Mr. Kiley making a statement was also discussed. Sue Clippinger of the Mayor's office said that there was no mention of Replacement Service in a recent press release concerning the MBTA's plans.
11. There was a general discussion about the concern that the elevated might be torn down before a superior replacement service is in operation. There was a request from community representatives that a high official state that this will not happen.
12. One of the Committee members made a statement that there may be problems getting people to the meetings until 5-6 alternatives have been derived for them to respond to.
13. There was a discussion of weekly coordination meetings to be held at the 90 Warren Street office. The community will be invited to participate in these meetings, which will include representatives from the MBTA and members of the Consultant Team. There was general discussion about the best time to hold these meetings. Dee Prim indicated that Fridays may be a problem for some agency heads who try to resolve some questions toward the end of the week. It was suggested that community concerns would be discussed at the first

April 5 Meeting Notes

part of the meeting, so that any persons attending from the community could leave early if they had to go to work. It was decided that the meetings will be held tentatively at 8:30 on Friday mornings. Clark Frazier indicated that he felt that having these meetings open was very important and had been successful in earlier Community Liaison processes in the South End studying Tremont Street and Columbus Avenue.

14. The Project Working Committee was defined as the MBTA, the Consultant Team and whoever shows up from the community and other agencies. There was some concern about the lack of representation from some areas at tonight's meeting. The response was that we are still getting into the process and that an intensive effort will be put forth to get all areas involved. The Governor's statement was again mentioned as being an assistance with that involvement.
15. It was mentioned that the Friday coordination meetings will take the place of a Steering Committee.
16. Dee Prim asked whether there are enough funds to hire a recorder for the meetings.
17. Michael Hawkins indicated his concern that the labels on tonight's meeting handouts are not clear. "They do not say what the content of the material is."
18. Tony Casendino (CBT) discussed the progress to date in contacting community organizations and setting up neighborhood meetings.
19. Ken Kruckemeyer from the MBTA discussed the existing MBTA system in the area and how well it met the MBTA service guidelines. Ken noted that the existing bus service almost meets the guidelines, and yet we know that the service is inadequate. Clark Frazier stated that the T makes the bus lines too short.
20. Someone made a comment that all maps should be titled and dated clearly.
21. It was noted that MBTA policy is a "headway of a 1/2 hour frequency." Some people indicated confusion as to what this meant.
22. A Committee member asked what the MBTA's bus shelter guidelines were. Ken responded that there were no strict guidelines but that bus shelters were related to a relationship between waiting time and the number of people using each line.

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23. It was noted that an MBTA Operations person should be present at all Working meetings. Someone from Operations had been invited to this first meeting and was unable to attend because of a last minute emergency.
24. Ken noted that the MBTA begins with a design for service as they think it is required, tests it for 6 months, and then increases or decreases the service based on the demand.
25. Ken Kruckemeyer described 2 extreme solutions to the area problem in order to develop responses from the community and indicate the range of selection. One extreme was complete radial and the other complete circumferential service.
26. Clark Frazier indicated an alternative solution might be 4 radiating lines from Dudley Station.
27. Sue Clippinger asked: "How can we discuss solutions without first getting the needs of the people? We need a map that shows where people want to go."
28. A Committee member indicated that we need a map that shows where jobs are, even out into the suburban areas surrounding Boston.
29. Clark Frazier proposed a network connecting centers such as Dudley, Mattapan, etc. Ken Kruckemeyer indicated there might be a conflict with the idea, if main crossstreets do not go through these centers.
30. There was a general discussion of "the base case." There seemed to be considerable confusion about the definition for the "base case."
31. Dee Prim indicated a concern that in Ken Kruckemeyer's presentation, he went directly into a discussion of bus line proposals without first getting community feedback. Ken's response was that he wanted to come up with a way of showing some alternatives.
32. Dee Prim asked if posters might be put up in the transit stations and in the transit cars themselves to inform people about the Study. It was indicated that this idea would be pursued but that posters must be printed by a union shop.
33. It was also suggested that as new timetables were issued for the area buslines, there be an announcement about the Study printed on them.

ATTENDANCE

<u>Name</u>	<u>Address</u>	<u>Phone</u>	<u>Affiliation</u>
Leon V. Jacklin	87 Hollingsworth, Mattapan	722-4300 x411	BRA-TPD
Norman Stembridge	20 Alpine St.	Work: 734- 4780 427-4053	Citizen
Dee Primm	44 Highland St.	427-0035 427-2197	SWCC
Bob Young	Lena Park	288-4900	SWCC
Jim Baecker	City Hall	722-4300	BRA
Bill Kuttner	14 Alleghany, Roxbury	442-5316	MIT
Alfred Howard	City Hall	722-4300	BRA
Roy Bishop	12 Harley St., Ashmont Hill Dorchester 02124	722-4300	BRA
Rod Parker	306 Dartmouth St., Boston	262-4354	CBT
Yong Chang	27 School St., Boston	523-3410	CTPS
Paul Porell	City Hall	722-4300	BRA
Paul Thorn	850 Boylston St., Brookline	731-1550	TAMS
Michael Hawkins	27 Dudley St., Roxbury	427-0035	SWCC
Calvin Dixon	716 Parker St., Roxbury	427-5561	New Life Church
Cecil Hansel	34 Williams St.	427-0169	Hansel & Johnson
Bruce Bolling	F. F. Little City Hall	287-0172	City Hall
Pat Brennan	850 Boylston St., Brookline	731-1550	TAMS
Peter H. Smith	306 Dartmouth St., Boston	427-7060	CBT
Peter A. Fine	92 Waltham St.	426-5876	8 Streets Assoc
Clark Frazier	29 Union Park	482-2148	SECOT
David Rauam	38 Dwight St.	426-3609	8 Streets Assoc
John Brown	31 State St., Boston	742-1930	JBA
Dick Tilles	850 Boylston St., Brookline	731-1550	TAMS
Rick Grey	90 Warren St., Roxbury	440-8090	GRDC
Peter Calcaterra	131 Clarendon St.	722-5834	MBTA
Ken Kruckemeyer	131 Clarendon St.	722-5834	MBTA

MINUTES OF PROJECT WORKING COMMITTEE MEETING

DATE: May 10, 1977

TIME: 7:45 PM to 10:15 PM

PLACE: 90 Warren Street Site Office

PRESENT: Please see attached list.

minutes

- 1) Tony Pangaro, MBTA Manager of Southwest Corridor Development, began the meeting by summarizing the importance of the study and the emphasis placed on it by the Massachusetts Bay Transportation Authority.
- 2) Tony introduced Robert Walsh, Boston Redevelopment Authority Director. Mr. Walsh emphasized the importance of the study to future development in the study area and described the coordinating role the BRA would play in the development area. Mr. Walsh invited questions from the audience.
- 3) A community resident asked Mr. Walsh what role the BRA would play assisting development in the area. Specifically, the questioner wanted to know whether the BRA would assist in financing businesses. The reply was that the Blue Hill Avenue Improvements and other city projects in the area would be coordinated so as to have a major impact on development.
- 4) Hugh Bunte from Grassroots in Dorchester asked what type of transit the study was considering. The three generalized route alignments were pointed out, and it was explained that the alternatives would be discussed in detail later in the evening.
- 5) Lavinia Underwood from Police Communications indicated her concern that the Orange Line was moved further away from certain areas. She stated that the existing Orange Line is "faithful" and that the community is aware that the Replacement service and improvements are most likely to be implemented and maintained if they serve areas in addition to the study area.
- 6) Percy Wilson, Roxbury Multi-Service Center (RMSC), asked what part the BRA will play in the study. Mr. Walsh responded that the BRA is represented at most major meetings and that they will continue to be involved in the study and coordinate city agencies.
- 7) Dee Primm asked about the BRA's commitment to upgrading Dudley Square and Egelston Square, recycling buildings, and maintenance of open space.

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- 7) Mr. Walsh's response was that the BRA was currently working with the Dudley Square Merchants. Recycling of any older buildings is only possible when a feasible use is identified. He said maintenance of open space is a Park and Recreation responsibility. He indicated that this maintenance item was of concern to the BRA.
- 8) Mike Hawkins from SWCC stated that if people from the BRA are specifically designated for the study, they should go to community organization meetings in order to hear the needs of the community.
- 9) Percy Wilson indicated that some people's "fantasy" is that the inner City is being revitalized for those people who are to come here as opposed to those people who are here, i.e. the South End situation.
- 10) Elbert Bishop, SWCC, proposed that the BRA give progress reports on city initiated improvements. He suggested that this be an agenda item for each future meeting.
- 11) Clark Frazier, SECOT, asked how the South End Renewal Project is going to get completed. Mr. Walsh answered that he did not know in detail how that was going to be accomplished, but indicated strongly that it had to be done.
- 12) Another community resident indicated that he lived in Dorchester and that he had heard no discussion except Dudley Station and the South End. It was made clear that the study was to include Dorchester and Mattapan as well.
- 13) Ken Cottman from Community Betterment Association (CBA) indicated that the transportation system south of Dudley Street Station is bad. Tony Pangaro responded that the purpose of the study was to suggest improvements to that part of the system.
- 14) Tony Pangaro introduced State Secretary of Transportation, Fredrick Salvucci. Mr. Salvucci stated that the existing Orange Line does not serve the groups impacted by this study very well. The stops are too far apart; therefore, supplementary busses are required. He emphasized the need for a broad constituency for the study. He said we have to accomplish a high degree of community agreement; otherwise we will not get Federal funds for any improved services. Secretary Salvucci stated that a goal was to improve the existing service now, so that people will not be discouraged and will feel that coming to these meetings is worthwhile.
- 15) Dee Primm asked if it were likely that there will be a combination of new transit systems proposed, as opposed to a single route. Secretary Salvucci made it clear that this was a clear possibility.

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- 16) Bill Kuttner, a Roxbury resident indicated his hope that the MBTA would realize that even though there may be no controversial issue, we should still be able to get a community consensus.
- 17) Another member of the community indicated that the residents did not know enough to propose transportation systems, "we are not experts."

The speaker stated "you have to come up with something for us to look at". It was indicated that the consultants had developed some proposals and that they would be discussed in the meeting.

- 18) Elbert Bishop asked Secretary Salvucci if he had preferred alignment based on cost and how he strategized his dealings with Washington to get funds.

Fred Salvucci responded that his personal preference had been for the Midland Branch alignment, however, he stated that it was just a "hunch". He said that he had not ruled out others, and was looking for something we all can agree on and did not want to waste time if people cannot agree. He indicated that he was optimistic about the results of the study.

- 19) Dee Primm indicated that her understanding was that the difference between the weekly Friday morning coordinating committee meetings and the monthly evening Project Working Committee meetings was that the Project Working Committee meetings were for consensus decisions and the Coordinating Committee Friday meetings are not. She said the Coordinating Committee meetings also include community participation.

Peter Calcaterra indicated that this is the correct interpretation of both meetings.

- 20) Nancy Crockett, a resident indicated that all the community wanted to know was if it could get what it wanted and how can it get it. She indicated having the current study seems to be studying the problem to death. Nancy Crockett asked Secretary Salvucci if the study was to determine if the plan that the community has approved earlier could be accomplished. Secretary Salvucci said it could be described that way, that it had to define the proposed solution better.
- 21) Gloria Fox indicated that she did not feel comfortable with the decision process. Peter Calcaterra said that was an important item and that should be discussed.
- 22) Peter indicated that the meeting was behind schedule and suggested that the agenda be revised to cover only the following four items. He suggested that the committee deal with the uncomfortableness discussed earlier by Gloria; Date of the next meeting; any remarks Senator Owens might like to make; and then a brief summary of the handouts that everyone received earlier in the meeting.

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- 23) After some discussion about conflicts on Wednesday and Tuesday evenings it was decided that the next meeting would be at 7:30 on May 24 at 90 Warren Street.
- 24) Elbert Bishop indicated that the 1st item on the next agenda should be short so that the meeting could get into the work done by the consultants to date quickly.
- 25) Clark Frazier indicated that community participants should bring forth all transportation alternatives that they wanted to have looked at as early as possible in the study.
- 26) Mike Hawkins called for a tightly run meeting in the future, indicating that this evening questions seemed too random.
- 27) Dick Tilles from TAMS presented a summary of all the materials in the meeting hand out.
- 28) Dee Primm asked why the Committee was looking at Generalized Alignment C (crosstown) since it was her understanding that another study was going on that would be looking at that area. It was indicated this (circumferential) study was not duplicating the work involved in the analysis of the area, but that the studies were complimentary.
- 29) Dee Primm asked whether Alignment C would be a trunk branch of the relocated Orange Line and if a "light rail" system was indicated. Dick Tilles indicated that Alignment C might be a trunk branch and that light rail was proposed so there could be a direct connection into the downtown Green Line subway system.
- Dee Primm asked whether the trackless trolley would be less costly in terms of maintenance over a long period of time. Dick Tilles indicated that there are too many variables to determine this at the present time.
- 30) Gloria Fox asked if the current problem with the Huntington Avenue line was indicated in the alignment evaluation.
- 31) Clark Frazier stated that he hoped the consultant would be able to come up with a chart or a way to explain that a Green Line connection to the downtown rail system would be less expensive than a bus system for a sufficiently large number of riders from the South End.
- 32) Dee Primm expressed disappointment that no one had the opportunity to learn who everyone is at the meeting. It was later suggested that with the large monthly attendance, name tags might be used.



Replacement/Transit Improvement Study
Project Working Committee
May 10, 1977 - Attendance

<u>Name</u>	<u>Address</u>	<u>Phone</u>	<u>Affiliation</u>
Elbert Bishop	791 Tremont St.	266-9779	SWCC
Alpha L. Howze	317 Blue Hill Ave.	427-4470	RMSC
Ralph Agee	317 Blue Hill Ave.	427-4470	RMSC & SWCC
Clark Frazier	29 Union Park	482-2148	SECOT
Charlotte Gridiron	125 Centre St.	440-9099	
Michael Hawkins	27 Dudley St.	427-0035	SWCC
Eugene Foster	122 Highland St.		
Sophia Schymonowytsch	1205 Hyde Park Ave.	361-6500	J.P.Citizen
H. U. Bunte	18 Esmond St., Dor.	436-5915	Grass Roots
Sue Clippinger	City Hall, Boston	725-4490	Mayor's Office
Bill Kuttner	14 Alleghany, Rox.	442-5316	MIT
Sam Fuchs	CTPS	523-3410	CTPA
Al Sopyla	CTPS	523-3410	CTPS
Yong Chang	CTPS	523-3410	CTPS
Lavinia Underwood	6 Heston Pk.	442-7714	Police Comm. Relations
Peter Lynch	MBTA, 131 Clarendon St.	722-5218	MBTA
Ralph Fitzmaurice	MBTA, 131 Clarendon St.	722-5217	MBTA
Susan Richardson	MBTA, 50 High St.	722-5215	MBTA
Richard Siegel	31 State St.	523-2215	R. Siegel Asso.
John Brown	31 State St.	742-1930	JBA
Perry Wilson	317 Blue Hill Ave.	427-4470	RMSC
Dee Primm	44 Highland St.	427-2197	Resident Frederic R. Harris
Andrew Jenkins, Jr.	90 Warren St.	427-7060	CBT Study Team
Thom. Payne	John Eliot Square	445-8393	1st.Ch.in Rox.

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Tippetts Abbett McCarthy Stratton Childs Bertman Tseckares Assoc. Inc.

<u>Name</u>	<u>Address</u>	<u>Phone</u>	<u>Affiliation</u>
Peter Calcaterra	131 Clarendon St.	722-5834	MBTA
Ken Kruckemeyer	131 Clarendon St.	722-5834	MBTA
Patrick Cooke	21 Thornley St.	282-0707	CBT
K. E. Cottman	10 Shafter St.	282-7577	CBC
Carole Ray	J.F.K. Bldg.	223-5715	Cong. J.J. Moakley
Fred Salvucci	Transportation	727-7683	State
Roy Bishop	17 Harley St., Dor.	722-4300, x. 289	Dir., Neighbor- hood Planning, BRA
Ted Wheaton	Mattapan Neighborhood	361-5621	
David Ransom	38 Dwight St.	426-3609	8 Streets
Robert A. Lepore	TAMS	731-1550	
Barry S. Porter	850 Boylston St. Brkline.	731-1550	TAMS
Nanci Crockett	14 School St. Dorch.	440-9800	
Tom Cheney	58 Tolman St. Dorch.		
Philbert Daley	105 Hazelton St. Mat.		
Gloria L. Fox	2249 Washington St.	442-5900	Rox. A.P.A.C.
Bill Owens	State Senate	727-8934	State Senate
Bernice Walker	725 Tremont St. #511	536-1156	
Jim Baecker	City Hall 02110	722-4300	BRA
C. Joseph Doyle	175 School St. Rox.	524-4236	Legislature
Robert Jones	791 Tremont St. E514	536-0036	
Albert Lewis	Mattapan Neighborhood	298-8798	
Vincent H. Farrar	30 Vesta Road Dorch.		Grass Roots Community Pro- gram
Rod Parker	306 Dartmouth St.	262-4354	CBT
E.R. Caston	81 Fort Ave		Rox. Highlands Neighborhood Assoc.
Jon Posey	18 Highland Pk. Ave.		Rox. Highlands Neighborhood Assoc.
Peter H. Smith	90 Warren St.	727-7060	R/TIS CBT
Anthony Casendino	306 Dartmouth St.	262-4354	CBT

MINUTES OF PROJECT WORKING COMMITTEE MEETING

DATE: May 24, 1977

PLACE: 90 Warren Street

TIME: 7:40 P.M. to 10:15 P.M.

PRESENT: Please see attached

minutes

1. Peter Calcaterra discussed decision making process of the study.
2. Dick Tilles described the current status of the study and the three generalized alignments, referring to wall maps.
3. Alfred Howard of the BRA asked if potential transportation investments would be evaluated based on the economic impact on the area served. Dick Tilles agreed and identified an example of this.
4. Dick Tilles discussed the "Preliminary Evaluation Chart."
5. Larry Jones asked what the cost figures referred to. Dick's response was that the cost was for total alignment.
6. Laury Kennedy asked if the number of stations was calculated for each alignment. Dick stated that the assumed station spacings were the same as in similar MBTA systems. Specific stations were not designated in developing the generalized alternatives.
7. Clark Frazier was disappointed that the operating costs were included since the T's costs included such items as about 50% of the Greenline cars out of service thereby increasing the per mile service cost.
8. Clark stated that the MBTA did not seem to evaluate service by how many riders were served. Alternatives with fewest riders would probably cost the least.
9. Mr. Smith raised questions about electrical problems on the MBTA system.
10. A question was raised about how the costs compared to the Washington, D.C. subway. Answer: costs are similar throughout the country... Costs for tunnel segments were based on the proposed Cambridge Red Line extension.
11. Bill Kuttner said he was not concerned with costs for their own sake but rather whether the cost figures would direct the study committee to the proper decision.

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12. Peter Calcaterra emphasized that the committee and the T, not the consultant, would establish the priority of the criteria that would be used to select alignments. The consultant will generate the information for the committee.
13. Hugh McCormack said the community doesn't want to hear about costs. They want to hear about service.
14. Mike Hawkins said it was important for everyone to have the cost information, but that the service criteria should be emphasized.
15. Dick Tilles described each option examined in each alignment.
16. Bill Kuttner asked whether with identical sized fleets of light rail vehicles vs. buses the service would be equal.
17. Ken Kruckemeyer said given the same number of people on any given line you will need fewer light rail vehicles than if you are using buses.
18. Mike Hawkins asked that the total annual cost column on the chart be clarified. Dick explained that the expected system life was used to determine the annual cost.
19. There was consensus that too much time had been spent at the meeting discussing costs and that the presentation should proceed without further interruption.
20. Paul Porell asked if the study would be looking at commuter rail types other than a (self-propelled) Budd car, such as dual mode vehicles. Dick said that other types would be studied.
21. Dick Tilles said that the major advantages of Alignment A. were that it is located in the corridor of the existing elevated line and that it serves the South End, Dudley and Grove Hall. Dick mentioned that the main advantage of constructing a high capacity line on the Midland alignment was the fast completion time and lower cost. It is an existing alignment and it is near areas (Uphams Corner and others) that are now not well served.
22. Peter Calcaterra requested comments on the ridership survey form by phone or in person at the next regular Friday morning meeting.
23. Peter Calcaterra asked the committee's opinion for a location for the June 28th meeting. He got several suggestions and said the matter would be decided at the coordinating meeting.

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24. Mike Hawkins asked for discussion about the process. He asked for a written definition of "consensus."
25. Ralph Agee stated that the process should be what this committee decides. It should not be what some group several years ago decided. This was in reference to a comment that the process for this study had been agreed to by a community group some months ago.
26. Ralph LeBeau suggested that since not everyone has had a chance to review the Working Committee procedures that people make comments in writing and that the discussion occur at the next meeting.
27. Mike Hawkins wanted to make it clear that there had been no acceptance of these procedures at this meeting.
28. Bill Kuttner pointed out that connections to proposed systems outside the area must be taken into account in the study. He also emphasized that multiple mode solutions must be examined.
29. Ken Kruckemeyer elaborated on the sequential process of looking at alignments and then more detailed studies of how specific areas are affected.
30. Hugh Bunte asked "Have you given any consideration to battery operated vehicles using solar (energy)?" Dick Tilles said, "Not yet, however, we do have a technological investigation study as part of our contract."
31. Sue Richardson discussed the list of neighborhood issues compiled by the consultants from neighborhood meetings. She said that hopefully schedules will be posted within the next six months. She also mentioned that schedule control is a direct result of how much street supervision is available.
32. Ralph LeBeau stated that the Forest Hills - Ashmont bus stops too early (6 pm). He wanted to know if there would be a response to this expressed concern. He asked if he would get a copy of the request for information.
33. Mike Hawkins asked if everyone would get copies of the requests that were made from the community and what had been done.
34. Bill Kuttner asked whether fringe parking would be studied. The answer given was that potential fringe parking locations would be evaluated based on ridership potential and community response.

35. Ralph LeBeau stated his feeling was that the connection to the Green Line from alignment B should not be given a high priority. Ralph stated that the importance of alignment B is to get to the downtown area and only secondarily to connect to the suburbs.
36. Martha Virginia Farrar wanted more chance to discuss immediate problems that are stated in section 3 (May 10 handouts) and to hear the MBTA's response.
37. Hugh Bunte asked for a separate meeting with the (T) to discuss community concerns. He said Mattapan to Dudley service is bad, people don't use it because it is not frequent enough, when it gets to Dudley it is crowded, and at night security is lacking. The response was that the (T) would consider setting up community meetings.

The following are answers to written questions received at the May 24 meeting:

1. What ridership is expected for alignments A, B & C?

Answer: Ridership forecasts will be made later by the Central Transportation Planning Staff in one to three months.

2. Are fringe parking lots being planned for the outer ends of A and/or B?

Answer: Fringe parking will be considered for all terminal points and evaluated on the basis of access to highways, land availability impact on the local community, and the U.S. Environmental Protection Agency's restrictions on parking.

3. Will alignment C connect Red Line with Orange and Green?

Answer: The cost estimates for alignment C were based on running from Ruggles Station on the Orange Line to Uphams Corner. However, we will investigate the possibility of connecting with both Green and Red Lines along this general alignment.

4. What general traffic plans are being discussed for the downtown terminals of A & B?

Answer: Details have not yet been worked out for downtown terminals. However, all alternatives will almost certainly be branches of or provide a transfer to existing MBTA services.

5. What are the arguments against having both A and B, plus C?

Answer: Ridership and other considerations may not warrant all three of the generalized alignments. However, various combinations of the alignments will be investigated and evaluated during the course of the study.

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Replacement/Transit Improvement Study
Project Working Committee
May 24, 1977 - Attendance

<u>Name</u>	<u>Address</u>	<u>Affiliation</u>	<u>Phone</u>
Yong Chang	27 School Street	CTPS	523-3410
Charlotte Gridiron	125 Centre St.	Centre St. Block.	440-9099
Robert Lepore	850 Boylston St.	TAMS	731-1550
Barry Porter	850 Boylston St.	TAMS	731-1550
Peter Calcaterra	131 Clarendon St.	Boston (T)	722-5834
Peter Smith	90 Warren St.	Roxbury/CBT	427-7060
Anthony Casendino	90 Warren St.	Roxbury/CBT	427-7060
Cecil Hansel	34 Williams St.	Roxbury/Equity Des.	427-0169
Laury Kennedy	108 Pembroke St.	S.E.Historic Soc.	353-0181
Ken Kruckemeyer	131 Clarendon St.	S.W. Corridor	722-5834
Paul Porell	City Hall	BRA-Trans.	722-4300
Dana Nottingham	65 Winthrop St.	W.F.E.M.	864-3500
Andrew Jenkins	90 Warren St.	Study Team	427-7060
Roberta Saunders	Lena Park	Amer. Leg. Hwy.	288-4900
Alfred Howard	City Hall	BRA	722-4300
Duane Polk	77 Codman Pk	Resident	442-3780
A.C. Young	150 Townsend St.	Blkstn Sq Comm Sch	262-2190
Larry Jones	135 W. Newton St.	Mayor's Office	725-3440
Susan Richardson	50 High St.	(T)	722-5215
Hugh McCormack	20 Rosemary St.	SWCC	522-6641
Michael Hawkins	27 Dudley St.	SWCC	427-0035
Bill Kuttner	14 Allegheny St.	MIT	442-5316
Dennis O'Brien	27 Dudley St.	SWCC	427-0035
Paul Kohler	58 Boylston St.	S.P.	522-7946
Marjorie Perry	53 Kingsdale St.	Grass Roots Comm.	825-9388
Ralph Agee	317 Blue Hill Ave.	R.M.S.C.	427-4470
Gwen Simmons	90 Warren St.	CBT/TAMS	427-7060
Lillie Morris	26 Vesta Road	Grass Roots	288-4928
Virginia Farrar	30 Vesta Road	Grass Roots	825-3505
Jack Wilkins Jr.	20 Morely St.	Resident	442-7189
J. Nathaniel Hailey	22 Sussex St.	Lower Roxbury	442-3044
Thom. Payne	1st Church of Rox.		445-8393
Hugh Bunte	18 Esdmond St.	Grass Roots	436-5915
Vincent Farrar	30 Vesta Road	Grass Roots	825-3505
King Harvey	31 State St.	JBA	742-1930
Luther Allen	19 Tennis Rd.	Mannahunt	296-3526
Clark Frazier	29 Union Pk.	SECOT	482-2148
Rod Parker	306 Dartmouth St.	CBT	262-4354
Earl Moore	20 Morley St.	Resident	442-7189
C. J. LeBeau	17 Lambert St.		427-5129
Ralph Fitzmaurice	50 High St.	MBTA	722-5215
Peter Lynch	50 High St.	MBTA	722-5217
Sue Clippinger	Boston City Hall	Mayor's Office	725-4490
Donald Roach	30 Mallon Rd.		
Ralph LeBeau	Boston City Hall	BRA	722-4300
Marie Faria		Resident	
Sam Fuchs	27 School St.	CTPS	523-3410
L. V. Randolph		G.R.D.C.	440-8090
Gloria Fox	2249 Washington St.	Roxbury APAC	442-5900
Dee Prim	44 Highland St.	Resident	427-2197
Dick Tilles	850 Boylston St.	TAMS	731-1550

Date: June 28, 1977

Time: 7:30 PM to 10:00 PM

Place: Charles Drew Family Life Center

Present: Please see following list.

minutes

1. Peter Calcaterra introduced Carlos Diaz from Community Affairs Dept. of the MBTA.
2. Carlos described the process for solving short term problems in the existing ① system. The information developed by the study will be analyzed by the Community Affairs Department with ② Operations for possible solutions. Potential solutions will be presented at the next Project Working Committee Meeting. In addition there will be neighborhood meetings conducted by the MBTA Community Affairs Department to pinpoint specific problems in the community.
3. Ethel Lenox from Dorchester inquired about the questions asked on the recent rapid transit questionnaire. Dick Tilles from TAMS (the engineering consultant) described the questionnaire and noted that the 30% response (3,000 questionnaires) will be tabulated over the next several weeks and the results will be available at that time.
4. Dick introduced Bob Lepore from TAMS who described the existing bus service in the area using three "service frequency maps" (Peak hours, Midday, and Evening); and three charts "How Fast Do Buses Go?", "How Crowded Are Buses?", "What Are Complaints About Existing Buses?"
5. Ethel Lenox asked how bus users are notified of revisions in the schedule or route changes. Susan Richardson of the MBTA Community Affairs Department replied that notices are handed out on the individual buses and notices published in local Boston newspapers.
6. Ethel Lenox asked what was done for Spanish-speaking transit users. Carlos described the Spanish phone number and other ways the Spanish-speaking people are notified.
7. Weston Morgan asked if the areas served by the buses shown as being crowded are the most populated areas. Bob Lepore answered that there was not a clear correlation to high density populated areas.
8. A question was asked about the possible use of mini-buses. Sue Richardson answered that the MBTA has tried mini-buses but that they have not worked out well because of maintenance problems, and have cost about as much to operate as standard size buses.

90 WARREN STREET ROXBURY, MASSACHUSETTS

CALL - 427-7060



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Tippetts Abbett McCarthy Stratton

Childs Bertman Tseckares Assoc Inc

9. Sue Richardson noted that trip frequency has been increased for the following route numbers: 15, 22, 23, 28, 29 and 43.
10. Joe McCallum from the Worcester Square Neighborhood Association noted that bus - #47, Central Square to City Hospital has had severe problems with crime throughout the MBTA system. "Handbags ripped open." Carlos noted that there are only 20-25 (T) Police on duty at any given time throughout the MBTA system. The (T) is proposing to enter into agreement with local police departments so that the (T) security force will be used to patrol underground lines and local police would aid on surface lines.
11. Weston Morgan asked if there is a law prohibiting standing on buses. Sue Richardson stated that she is aware of no regulation. (It is believed that the DPU limits the maximum total number of passengers in a bus to 180% of seated capacity.)
12. Mary Longo from Uphams Corner asked why the tranfers were dropped, Sue Richardson said there were two factors: A) lost revenue and B) limited control over paper transfers. Sue noted that there is a Fare Control Committee which is planning to submit a report by November with a goal of system-wide fare equity.
13. Mrs. Herbert, Chairperson of the Board of the Charles Drew Family Life Center, asked who determines the location for bus stops. Sue Richardson noted that the Operations Director determines the locations. Mrs. Herbert said she has a specific, extremely difficult problem with a new bus stop outside the Charles Drew Center.
14. Rosalyn Horner of Dorchester asked for information about what was going to be done about the problems with the additional trains soon to start running on the Midland Railroad Line. She mentioned noise, air pollution and safety were important concerns of people in her area.
15. Ken Kruckemeyer stated that welded rail will be used on the upgraded Midland, that will cut down substantially the high noise level normally associated with railroad trains, particularly where there has been poor maintenance.
16. Joe McCallum asked if it was possible to build an acoustical wall to cut down on the noise. Ken Kruckemeyer answered that the only effective wall will have to be 15 feet high and can be an ugly addition to backyards and neighborhoods. These walls would cut down on sun and crime surveillance in any areas where they are installed.
17. A resident asked if stations are going to be put immediately on the upgraded Midland Line. Ken Kruckemeyer said that no stations are planned to be added immediately, but that eventually stations would be constructed if the Replacement/Transit Improvement Study indicated it was appropriate.

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18. Margaret Conner, a community resident, asked why the ① is going to bus the people from Needham, and why they are not planning to bus people from Stoughton instead of using the Midland branch railroad. Ken Kruckemeyer responded that bus service from Franklin and Stoughton would be more circuitous than from Needham. AMTRAK must be run continuously in any case.
19. Rosalyn Horner asked why the elevated line is being painted if it is going to be torn down in 1983. Ken Kruckemeyer replied that the structure had to be repaired in order to be safe for the next five years.
20. Peter Calcaterra asked for comments regarding the next Project Working Committee meeting date. Tuesday July 26 was selected. Place of meeting will be determined during the next few weeks.

Replacement/Transit Improvement Study
 Project Working Committee
 June 28, 1977 Attendance

<u>Name</u>	<u>Address</u>	<u>Affiliation</u>	<u>Phone</u>
Michael Hawkins	27 Dudley Street	SWCC	427-0035
Peter Calcaterra	131 Clarendon St.	MBTA	722-5834
F. T. Roberts	P.O. Box 550		442-2185
Paul Porell	City Hall	BRA	722-4300
Mary Helen Lorenz	C.D.C. of Boston	25 Ruggles St.	442-2114
Jose Perez	C.D.C. of Boston	25 Ruggles St.	442-2114
Lydia Mercado	WFEM	3 Cazenove St.	864-3500
Cecil Hansel	34 Williams St.	Equity Design	427-0169
Myrod Emmanuel	305 Memorial Dr. Rm. 403 A	SWCC	
Jim Baecker	City Hall	BRA	722-4300
Karen L. Harr	City Hall	BRA	722-4300
Alfred Howard	City Hall	BRA	722-4300
David D. Barrick	35 Union Park		423-1267
Andrew Jenkins	90 Warren Street	CBT	427-7060
Adua Young	Blackstone Sq. School	50 W. Brookline St.	262-2190
Laine Butterworth	682 Mass. Ave	Worc. Sq. Neigh. Assoc.	266-4472
John Brangayae	27 Worcester Sq.	Worc. Sq. Neigh. Assoc.	267-6580
Thomas E. Payne	P.O. Box 549 Rox.	1st Ch. in Rox.	445-8393
Yong Chang	27 School Street	CTPS	523-3410
Ellen Gordon	27 School Street	CTPS	523-4310
Sue Clippinger	City Hall	Mayor's Office	725-4490
Jaci Hall	538 Mass. Ave.	WFEM	536-3419
Weston Morgan	48 Woolson St.	C.P.A.C.	282-2210
Jorge N. Hernandez	405 Shawmut Ave.	IBA	262-1342
George E. Kins	632 Blue Hill Ave.	CDFLC	436-3000
Susan Richardson	50 High St.-4th Fl.	MBTA	722-5215
Carlos Diaz	50 High St.-4th Fl.	MBTA	722-5215
George Alieu	131 Ckarebdib St.	MBTA	722-5834
Barry Porter	850 Boylston St.	TAMS	731-1550
Robert Lepore	850 Boylston St.	TAMS	731-4550
J. Mary Longo	62 Sawyer Ave.	Dorchester	282-8293
Beverly M. Hiplip	81 Sawyer Ave.	Dorchester	288-1858
Margaret Connor	74 Sawyer Ave.	Dorchester	825-8547
Eena Prohaska	8 Peverell Street	Dorchester	265-7583
Alpha L. Howze	RMSC	317 Blue Hill Ave.	427-4470
Rosalind P. Horner	1 Bowdoin Ave.	Mt. Bowdoin Better.	288-4836
Joe Ureneck	2 Marlowe St.	Dor-Comm News	265-1696
Leora Jaeger	50 High St.	MBTA	722-5215
Ethel W. Lennox	9 Jerome St.	Dorchester	265-5776
Dick Tilles	850 Boylston St.	TAMS	731-1550
Phyllis Herbert	87 Ellington St.	Dorchester	
Clark Frazier	29 Union Park	SECOT	482-2148
William A. Koelich	23 Union Park	Union Park Neigh. Ass.	426-6186
Jack Toby	35 Union Park	BHA	482-6872
Rod Parker	306 Dartmouth St.	CBT	262-4354
J. E. Raffety	35 Worcester Sq.	Worc. Sq. Assoc.	247-0570
L. V. Randolph	90 Warren St.	GRDC	440-8090
Donald Roach	30 Mallon Road	Dorchester	725-3270
Sam Fuchs	CTPS, Boston	CTPS	523-3410
Joseph McCallum	35 Worcester Sq.	Worc. Sq. Neigh. Assoc.	247-0570
Byron Rushing	Box 5, Dudley Sta.	Mus. of Afro-Am. Hist.	445-6400
Ken Kruckemeyer	131 Clarendon St.	MBTA	722-5834
Patrick Cooke	90 Warren St. Rox.	CBT	427-7060
Peter Smith	90 Warren St. Rox	CBT	427-7060

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MATTAPAN

MINUTES OF PROJECT WORKING COMMITTEE

DATE: July 26, 1977

TIME: 7:45 PM to 10:15 PM

PLACE: Roxbury Multi-Service Center, 317 Blue Hill Avenue.

PRESENT: Please see attached list

minutes

- 1) Peter Calcaterra, from the MBTA project office, described the purpose and progress of the study.
- 2) Several members of the committee discussed the fact that previous studies and transportation documents (BTPR, Boston Transportation Planning Review; PMT, Program for Mass Transportation; TIP, Transportation Improvement Program) have indicated solutions to the study area's transportation needs. They indicated they were confused because the current study seems to be studying additional solutions. Peter Calcaterra answered that earlier studies were not complete in enough detail or documented adequately for an effective evaluation by the community or funding by the federal government. However, the inclusion of a project description and funding in these documents indicates the desire on the part of the State to make substantial improvements to transportation in this area.
- 3) Carlos Diaz, from the MBTA's Community Affairs Department, described the work that is going to be done to analyze bus routes #15, #29, and #44 by the MBTA Community Affairs Department with assistance from the ABCD program.
- 4) Carlos will be holding community meetings during August to discuss existing MBTA bus problems in the area.
- 5) Dick Tilles, from the consultant team, described the three (3) generalized alignments chosen from the study area and the eight (8) specific alternatives which the team of consultants, the MBTA project office, interested residents and representatives of the city and community agencies propose be analyzed in detail by CTPS and the consultants. The specific alternatives include a range of alignments - Washington Street, Blue Hill Avenue, Warren Street, Midland Branch - and several modes - light rail vehicles (trolleys), buses, rapid transit and commuter rail. A hand-out distributed at the meeting described the 8 alternatives.



These alternatives have been selected so as to consider as many options as possible and will be analyzed during the the next two months. Details of the analysis will be presented at the September Project Working Committee Meeting and at community neighborhood meetings.

- 6) Alfred Mickiewicz, from Dorchester Fair Share, expressed extreme concern about the trains that will be going along the Midland line during the construction of the relocated Orange line. Mr. Mickiewicz asked Ken Kruckemeyer to come to a meeting on Tuesday, August 16, 1977 at St. Kevin's in Uphams Corner to discuss the associated problems of the Midland trains.
- 7) Barbara Rucker from the SWCC, said that she thought it would be important for people to try using an existing light rail vehicle (LRV) before deciding on the best vehicle to recommend in the study since she thinks that LRV's tend to be more crowded than other vehicles. Clark Frazier said that he felt very negatively about buses and trackless trolleys for use in the South End.
- 8) Robert Timmerman indicated concern that a rapid transit line would run less frequently and therefore provide poorer service. Dick Tilles indicated that the pros and cons of all the various vehicle types will be documented by the study.
- 9) Ralph Lebeau, BRA Planner, suggested that similar alternatives be colored alike in order to make selection easier.
- 10) Dick Tilles described the ways the alternatives will be evaluated by the working committee. He reviewed the several criteria for evaluation which have been discussed at previous project working committee meetings and were included in the handout for the meeting.
- 11) Ralph Lebeau suggested that the study should be very careful to measure the alternatives by the social benefits to the communities involved as well as the ways described by Dick Tilles.
- 12) Ralph Agee, from the Roxbury Multi-Service Center, said that he felt it is important to put weights on the various ways alternatives will be evaluated. The merits and disadvantages of a rating system were discussed. It was the general feeling that ratings could be used in such a way as to justify just about anything. In addition, the time required for the working committee to rate and weigh each evaluation item would be extensive. Peter Calcaterra indicated that the conclusions about the alternatives will be made at the Project Working Committee Meetings by consensus whenever possible or by vote if a consensus were not clear.

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- 13) Mike Hawkins, SWCC, indicated that an important issue is maintenance of the fence along the Midland line for the safety of the people living there during the time the 60 trains will be running there while the relocated Orange line is being constructed. Ken Kruckemeyer indicated that safety during the time trains run on the Midland Branch is the responsibility of Amtrak.
- 14) Rosalyn Horner, from the Mount Bowdoin Betterment Association, asked if there is a piece of the budget available for safety education for school children to alert them to the new danger caused by the Midland trains. Ken Kruckemeyer said there is no current provision, but he will look into the possibilities.
- 15) There was general discussion about the credibility of the study and the role of the community in the decision-making process vs. the role of the MBTA. Peter Calcaterra, stated that community groups have suggested modifications to the process used in the Orange Line Relocation EIS which had been presented at earlier Project Working Committee Meetings for use in this study. As for the process of alternative evaluation previously discussed, it is proposed that decisions be made by consensus, and that if consensus is not clear, a tally of votes.
- 16) The next Project Working Committee Meeting will be held on Wednesday, September 14. It was suggested that it begin at 7:00 and that a public address system be used. The place will be announced later on.

Replacement/Transit Improvement Study
Project Working Committee
July 26, 1977 - Attendance

Name	Address	Affiliation	Phone
Willie Coleman	92 Bird Street	Fair Share	288-6614
Gene Wright	18 Elm Hill Prk		427-4258
Luis Seoane	409 Dudley St. Roxbury	Alianza Hispana	427-7175
John Brown	31 State St. Boston	JBA	742-1930
Matthew Coogan	EOTC		523-3410
Yong B. Chang	27 School Street	CTPS	523-3410
Charles J. Calvey	34 Warren St. Rox.	Dudley Term Merchant Assn	442-8181
Nancy Timmerman	25 Upton Street		266-2595
Robert Timmerman	25 Upton Street		266-2595
Leon Hines	64 Crestwood Park	Afro Amer. Museum	445-7400
McCallister Canada	63 St Richard St.	" "	445-7400
Craig M. Inge	95 Morton Village Dr.	GRDC	440-8090
George M. Williams	90 Warren St. Rox.	Greater Rox. Dev. Corp.	440-8090
Barbara D. Rucker	27 Dudley St.	S.W.C.C.	442-2424
Michael Hawkins	27 Dudley St.	S.W.C.C.	427-0035
Myron Emanuel	27 Dudley St.	S.W.C.C.	427-0035
Bill Kuttner	14 Alleghany St.	Mission Hill	442-5316
Paul Porell	Boston City Hall	BRA	722-4300 ext248
Karen Harr	Boston City Hall	BRA	722-4300 ext 295
Jimi Vincent	65 Winthrop St.	WFEM	864-3500
Marina Merin	2 Arien St. Dorch	Dorch F.S.	265-52110
Audrey Jacobs	5 Nottingham	Dorchester	825-2706
Christine Kukka	28 Payson Ave, Dor.	Dor. Fair Share	436-6438
Alfred Mickiewicz	7 Whittemore Terr., Dor.	Dor. Fair Share	436-641

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Name	Address	Affiliation	Phone
Arthur Martin	167 Centre St., Rox.	F.I.R.S.T Inc.	427-1588
James Worrell	25 Vaughn St., Dor.		282-6013
LaMonte Newsome	109 Packdale St.	Private Cit.	288-6869
Dan Ocasio	131 Clarendon Street	T SW Corridor	722-5834
Joseph B. Wheeler	64 Harold St.	United Broker	445-2222
Kitty Langford	Dudley Station	MAAH	445-7400
Ken Kruckemeyer	131 Clarendon St.	T SW Corridor	722-5834
Annie Mae Moore	231 Callender St.		436-0805
Jim Baecker	City Hall	BRA	722-4300
Alpha Howze	317 Blue Hill Ave.	RMSC	427-4470
David Kruschwitz		EOTC	727-2775
Joe Ureneck	2 Marlowe St.	DCW	265-1696
Rosalind Horner	1 Bowdoin Ave.	MBBA	288-4836
Michael Kirner	10 Deering Rd.	Mattapan	
Shirley Carter	44 Wilcock St.	Dorchester	
Rick Bohn	Boston City Hall	BRA	722-4300
L.V. Randolph	90 Warren St.	GRDC	440-8090
Ralph Agee	317 Blue Hill Ave.	B.M.S.C.	427-4470
Alfred Howard	City Hall	BRA	722-4300
Barry Porter	850 Boylston St.	TAMS	731-1550
Clark Frazier	29 Union Park	SECOT	482-2148
Robert Lepore	850 Boylston	TAMS	731-1550
Ralph Lebeau	City Hall	BRA	722-4300
Roy E. Neblett	City Hall	BRA	722-4300
Martha Barriere	Claremont Pk.		

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SOUTH END

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Name	Address	Affiliation	Phone
Byron Rushing	Box 5, Dudley Sta., Rox.		445-7400
Cecil L. Brown	27 Dudley	SWCC	427-0035
Thomas Payne	P.O. Box 549	1st Ch. in Rox.	445-8393
Linda Eubanks	141 Spencer St., Dor.	Concerned Citizen	436-0963
Kenneth Temell	418 Bowdoin St., Dor.		288-4266
Carlos Diaz	50 High St.-4th fl.	MBTA	722-5215
Gloria L. Fox	178 Humboldt Ave.	Rox MPAC-SWCC	442-5900
Peter Smith	90 Warren St.	CBT	427-7060
Anthony Casendino	306 Dartmouth St.	CBT	262-4354
Dick Tilles	850 Boylston St.	TAMS	731-1550
George Alieu	207 Chestnut Ave., J. Plain	T SW Corridor	722-5834
Peter Calcaterra	131 Clarendon St.	T SW Corridor	722-5834
Rod Parker	306 Dartmouth St.	CBT	262-4354

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minutes

MINUTES OF PROJECT WORKING COMMITTEE MEETING

DATE: September 14, 1977

PLACE: Shelburne Recreation Center, 270 Washington St., Roxbury

TIME: 7:00 to 10:15 P. M.

PRESENT: Please see attached

1. Peter Calcaterra, MBTA project manager, described the study and discussed the agenda for the meeting. He indicated that the various alternatives to be presented showed documentation of various modes and alignments, and that the final selection of three to five approaches for detailed analysis during Phase II of the study may involve combinations of various segments of the alternatives documented to date.
2. He introduced Carols Diaz from the MBTA Department of Community Affairs who described a survey he has conducted of the existing bus service in the area.
3. Patrick Cooke, from CBT/Childs Bertman Tseckares Associates Inc., consultants to the MBTA, has been working with Carlos on the bus study. Pat described the process used by several community residents to monitor the bus service on three routes.
4. Carlos Diaz described the results of the study on the three bus lines. He listed the actions the MBTA intends to take to solve the problems made evident by the study.
5. Several community residents pointed out existing busline problems and asked questions about how improvements to service can be implemented. Among the many problems discussed were the difficulties caused by Union Rules.
6. Ken Kruckemeyer from the MBTA Southwest Corridor office described meetings he has had with people who are concerned with the forthcoming increase to 60 trains a day on the existing Midland rail line. Ken described MBTA actions as a result of the meetings. The MBTA will be providing barriers in certain locations for school children to alert them to the new danger; and possibly one or two commuter train stops on the line during the increased service. Ken asked that anyone at the meeting who was interested in discussing specific station locations on the Midland line meet with him after the meeting or call him at 722-5834.



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September 14 Meeting Notes

7. Dick Tilles from Tippetts Abbett McCarthy Stratton (TAMS), the transportation consultants for the study, described the eight transit alternatives for the study area currently being documented.
8. Dick reviewed the descriptive material that was handed out at the meeting.
9. Bill Kuttner from the South End asked how it was possible for some trip times to be the same for Alternative #2 light rail alternative and Alternative #6 which is a bus alternative. Dick Tilles indicated that the proposed busway system includes several one-seat routes to the downtown area eliminating waiting times at the major alignment. Waiting times are included in the trip times for the light rail alternative.
10. Clark Frazier, from the South End, indicated that multi-destination trips should be considered in the study. One of the goals of the study should be to maximize transit riders.
11. Ken Terrell from Dorchester suggested that the study should consider an elevated solution. Various community residents disagreed with him. Their points were that even the new BART system in California is noisy and that an elevated structure would hamper urban development.
12. Clark Frazier said that Alternative #9 should not be studied in Phase I. He said this alignment is not that much different from Alternative #5, and that the busway in #9 is unacceptable to the South End Community.
13. Peter Calcaterra stated that Alternative #9 is one which had been suggested in the published Program for Mass Transportation and should be documented and evaluated against other alternatives during Phase I. It was agreed that documentation for #9 will be developed during the next month for discussion at the October Project Working Committee meeting.
14. Jorge Hernandez, from Inquilinos Borinquén en Acción (IBA), asked about future neighborhood meetings. He commented that there have not yet been any meetings where people have had a chance to say which Alternative they like best. Tony Casendino from CBT noted that there will be neighborhood meetings during September and October to do this - where people can express their opinion.

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September 14 Meeting Notes

15. Jack Toby from the South End commented that he sees the following conclusions possible from the material presented at the meeting:
- a. Crosstown service looks surprisingly good and must be included in the 3 to 5 Alternatives selected at the end of Phase I.
 - b. Egleston Square isn't well serviced by any of the Alternatives. This is presumably because it is better served by the relocated Orange Line and, therefore, Alternative #1 should be dropped.
 - c. All the transportation modes studied in Phase I should be carried through on at least one alternative in Phase II.
16. Peter Calcaterra stated that additional documentation will be available prior to the October meeting. Decisions regarding selection of alternative alignments and modes for analysis in Phase II should wait for this documentation.
17. Peter Calcaterra stated that the next Project Working Committee meeting will be held in late October. The time and place of the meeting will be announced within the next two weeks. He reminded all attendees to evaluate the various alternatives discussed at the meeting based on the criteria and information distributed by the consultants so that selection of the three to five alternatives for Phase II can be best accomplished at the October meeting.

CORRECTION:

The number of new riders for Alternative #6 (Busway) given in the "Description of Transit Alternatives" and shown on page 8 of the "Evaluation of Transit Alternatives" (table 3) should read 8,800 trips instead of 17,700 trips.

Replacement Improvement Study

Project Working Committee

September 14, 1977 Attendance

<u>Name</u>	<u>Address</u>	<u>Affiliation</u>	<u>Phone</u>
1. John T. Walker, Jr.	150 American Legion	Lena Park LDC	288-4900
2. Ralph Agee	317 Blue Hill Avenue	RMSC	427-4470
3. William T. Baker	One City Hall Square	BRA	722-4300
4. Jim Baecker	City Hall	BRA	722-4300
5. Mary Brathwaite	759 Shawmut Avenue	LRCC	445-1061
6. Pat Brennan	90 Warren Street	TAMS	
7. Cecil Brown	27 Dudley Street	SWCC	427-0035
8. John Brown	31 State Street	JBA	742-1930
9. Charles J. Calvey	34 Warren Street	Dudley Merchant	442-8181
10. Peter Calcaterra	131 Clarendon St.	MBTA	722-58..
11. A. B. Casendino	306 Dartmouth St.	CBT	427-7060 262-4354
12. Yong Chang	27 School Street	CTPS	523-3410
13. Sue Clippinger	City Hall	Mayor's Office	725-4490
14. John A. Cruz	12 School Street	CRUZ Const.	296-5040 442-7285
15. Carlos Diaz	50 High Street	MBTA	722-5214
16. C. Joseph Doyle	175 School Street	Rep. J. Craven	524-4236
17. Sara Driscoll	33 Lourdes Avenue	Tenant Action	524-3541
18. Clark Frazier	29 Union Park	SECOT	482-2148
19. Mary H. Goode	State House	Representative	727-5375
20. Alice Gray	One City Hall Plaza	BRA	422-7300 Ext. 299
21. Gloria Greene	P. O. Box 351		427-7377
22. Karen Harr	City Hall	BRA	722-4300 Ext. 301

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MATTAPAN

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Replacement/Transit Improvement Study

Project Working Committee

September 14, 1977 Attendance

23. J. Hernandez	12 Rutland Square	IBA	262-1342
24. Leon Hines	64 Crestwood Park	MAAH	445-7400
25. Roz Horner	1 Bowdoin Avenue		288-4836
26. Phil Iteer	8 Quincy Street		442-6860
27. Robert Joseph	15 Wayland Street	IBA	445-7126
28. Ken Kruckemeyer	131 Clarendon	MBTA	722-5834
29. Chris Kukka	28 Pay	Fair Share	536-4192
30. Bill Kuttner	14 Alleghany	Mission Hill	442-5316
31. Dave LaPlante	93 Forest Hills St.		495-3509
32. Pocco Mancini	50 High Street	MBTA	
33. Peter J. Metz	94 Waltham Street	SECOT	542-7937
34. Agnes M. Owens	120 Humboldt		427-4198
35. R. D. Parker	306 Dartmouth St.	CBT	262-4354
36. G. Perez	405 Shawmut Avenue	IBA	262-1342
37. Dick Pierce	2080 Washington St.	Boston Pops	440-7600
38. Paul Porell	City Hall	BRA	722-4300
39. Glen M. Porter	791 Tremont St.	S.C. Fuller Mental Health Center	266-8800 Ext. 301
40. L. V. Randolph	90 Warren Street	GRDC	440-8090
41. Melanie Ray	City Hall	OPD	725-4490
42. Susan Richardson	50 High Street	MBTA	722-5215
43. Maria Rivera	140 St. Botolph St.	S.E. Community	598-8800
44. Peter Smith	306 Dartmouth St.	CBT	262-4354

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SOUTH END

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MATTAPAN

Replacement/Transit Improvement Study

Project Working Committee

September 14, 1977 Attendance

<u>Name</u>	<u>Address</u>	<u>Affiliation</u>	<u>Phone</u>
45. Catherine H. Smith	191 Norwell Street	Fair Share	825-5442
46. Kenneth Terrell	418 Bowdoin St., Dor.		288-4266
47. Dick Tilles	840 Boylston Street	TAMS	731-1550
48. Jack Toby	35 Union Park		482-6872
49. Jim Vincent	65 Winthrop Street	WFEM	864-3500

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minutes

MINUTES OF PROJECT WORKING COMMITTEE MEETING

DATE: October 26, 1977

PLACE: Boston City Hospital Auditorium

TIME: 7:15 to 11:05 P.M.

PRESENT: Please see attached list

- A. Anthony Pangaro, Southwest Corridor Coordinator, reviewed the various projects in the Southwest Corridor, explained the goals of this study, and its relationship to other programs and plans. He emphasized the State's existing commitment to the Replacement/Transit Improvement concept and the need for commitment and support from the community.
- B. Peter Calcaterra, MBTA Project Manager for the study, explained the format for the meeting and introduced Dick Tilles, of Tippetts-Abbett-McCarthy-Stratton (TAMS), consultants to the MBTA, who are conducting the study.
- C. Dick Tilles described the development and evaluation process used in the study to date and reviewed the results obtained for the eleven specific alternatives examined in Phase I, including various vehicle types and alignments.
- D. Tony Casendino, of Childs Bertman Tseckares and Casendino inc. (CBT), Community Liaison consultants for the study, described various types of transit vehicles and explained the options recommended by the consultant for detailed analysis in Phase II of the study. These options were described in the material mailed to the community mailing list prior to the meeting.
- E. Tony Pangaro reviewed the consultant's recommendations as shown in the chart (Exhibit #3 in the mailing), and the map of "Components of Alternatives" and indicated that the purpose of the meeting was to seek the community's response to the recommendations and to determine whether or not there was agreement to proceed as recommended.

THE MEETING WAS OPENED TO QUESTIONS AT 8:07 P.M.

1. Wayne Sherwood from the South End asked why all route descriptions for Light Rail Vehicles in Zone 2 (Roxbury) seemed to indicate Dudley to Huntington Avenue with no routes going to the South End via Washington Street.

Mr. Pangaro answered that all Light Rail Vehicle routes in Zone 1 could go directly downtown via Washington Street.

call: 427-7060

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2. Mary Aster from the Neighborhood Association of the American Legion Auxiliary Coalition, indicated that she did not want "rail" on Blue Hill Avenue and that she preferred busses.

Mr. Pangaro indicated that buses were proposed to be studied on Blue Hill Avenue as well as rail options in Phase II. He also noted that the Mattapan to downtown running time for buses was predicted to be 26 minutes.

3. Hugh Bunte from Grass Roots, a coalition of concerned people for city-wide justice and equality, indicated that his group did not see any point in studying the possible future transportation systems until the MBTA shows it can improve the existing service. He also asked what methods were being used in the study for determining future developments.

Anthony Pangaro replied that Carlos Diaz from the MBTA Community Affairs Department has been studying existing route problems in the area. He noted that while some progress has been made, it is going to take time. He agreed that the community has a right to expect results.

He noted that the Boston Plan anticipates development on Blue Hill Avenue and Warren Street and that working with the city and the community to predict growth will be a critical part of Phase II work.

4. Kenneth Terrell of Dorchester asked if it would be cost effective to make the Midland Railroad a branch of the Red Line tying in at South Station.

Dick Tilles replied that this had been looked at and that this solution would decrease frequency of service in the existing two southern Red Line branches.

5. Alan Root, Chairman of the Boston Public Housing Tenant Policy Council, indicated that the recommended systems seemed to be downtown oriented. He stated that all the alternatives other than busway with a feeder bus system seemed to be too inflexible, would be noisy, not aesthetically pleasing, and generally disagreeable.

Dick Tilles noted that the crosstown service was recommended for study in Phase II and the feeder bus system was included in each alternative to give more flexibility. He also noted that new rail vehicles are less noisy than older vehicles in general use in Boston.

6. Peter Fine, from the 8 Streets Neighborhood Association, commented that buses currently in service are noisy. He wanted to see a lot of money spent up front on something that would be impossible to give up when the "spotlight is off." Bill Kuttner from Mission Hill agreed and added that buses are unreliable.

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7. Clark Frazier, from the South End Committee on Transportation (SECOT), said that Rapid Transit in the South End should not be pursued in Phase II because of lack of stops, cost, and poor surface accessibility. He indicated that if a busway is finally selected for the South End, they will insist the elevated be kept up. He indicated that a busway on Seaver Street should be carried into Phase II. Such crosstown service would help make the total system truly a multidirectional one, not just servicing downtown.
8. Cecil Brown, from the Southwest Corridor Coalition (SWCC), supported carrying upgraded service on Seaver Street into Phase II as well as service on Washington Street from Dudley to Egleston Station. Several people in the audience agreed with this idea.

Dick Tilles indicated that the Washington Street alignment is not recommended for any type of transit vehicle except buses on the street, because it would require a costly tunnel or land takings. He added that the new Orange Line will serve most of the riders that would use the Egleston to Dudley route and, therefore, the benefits do not justify the cost.

9. Ralph LeBeau from the Boston Redevelopment Authority (BRA) stressed the need for studying development options and rapid transit on the Midland Branch in Phase II of the study.
10. Paul Porell, from the BRA, indicated that a busway was justified on Seaver Street. Anthony Pangaro asked for a consensus from the meeting about whether people wanted a busway on Seaver Street studied in Phase II. After some discussion, he said that we will go forward with a Seaver Street busway recommendation with extensions to South Huntington and Ashmont.
11. John Dean from Mattapan Little City Hall, wanted to see a list of names of participants and speakers. Mr. Pangaro noted that the Project Working Committee minutes are mailed and include a list of speakers and all who sign in.
12. Marc Weiss, from the Massachusetts Law Reform Institute, asked about a personal rapid transit option (PRT); whether the crosstown service would be a portion of the proposed circumferential service; and whether the state would fund such services. Anthony Pangaro replied that PRT in Morgantown, West Virginia, did not work very well. He indicated that the crosstown option could be part of a future circumferential service and could be funded separately.
13. Wendell Verril of the Centro del Cardenal, asked about whether parking would be eliminated on Washington Street and whether trackless trolleys will be considered since he felt they were quieter.

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Dick Tilles answered that on most of Washington Street parking on the side of the street would remain and the specific details would be worked out in Phase II. He noted that trackless trolleys will be considered in Phase II.

14. Rose Mehegan, from the Worcester Square Association, said she favored rapid transit in part for safety. Dick Tilles indicated that the safety issue will be studied in relation to the median in Phase II. He also noted the disadvantages of Rapid Transit on Washington Street.
 - a. It has to be in a tunnel which is very expensive
 - b. It will take a long time to implement leaving the South End without a replacement for quite a while
 - c. Stations would be much farther apart than if the service used other vehicle types.
15. A long discussion developed on the pros and cons of rapid transit along Washington Street in the South End. Cecil Brown from SWCC noted how reliable and fast the existing rapid transit service is. Bill Kuttner spoke against it because of cost benefits. Barbara Lung from the South End asked if fixing the existing elevated had been considered. Mr. Pangaro said no, that the structure was too far gone for anything other than emergency repairs. Joyce Stanley from Roxbury proposed that rapid transit on Washington Street not be dropped. Clark Frazier spoke against Rapid Transit and in favor of Light Rail. Ann Hershfang from the South End outlined the history of how SECOT came to a recommendation of Light Rail over Rapid Transit or Bus.
16. Francis Moore from the Worcester Square Neighborhood Association asked for Light Rail and Rapid Transit to be studied on Washington Street so that options other than buses would remain available. Wendell Verril asked if a subway in the South End affected other areas.

Anthony Pangaro noted that other area groups can propose subway or surface vehicles regardless of the South End decision. They can choose to connect to the Washington Street Service or the new Orange Line at Ruggles. He also noted in response to a question about bus pollution (fumes) that it will be studied in Phase II. The current position of the Carter Administration is that buses must be included in the study. The State has planned to request enough money for Light Rail on Washington Street (\$25 million). That is not enough to build a subway; however, it is the communities' prerogative to select options without regard to cost.
17. Alan Wood said nobody in the South End wants to keep the elevated up. He thought a combination of light rail and busway should be

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looked at. He mentioned that when we talk about buses there is a lot of new technology that is better than what the MBTA now has. He asked that handicapped requirements, and travel times be studied. Mr. Pangaro said they will be studied in detail in Phase II.

18. After a ten minute break, the meeting reconvened at approximately 9:45. Anthony Pangaro started a discussion about dropping the rapid transit alternative on the Midland Line in Zone 2.
19. Clark Frazier supported carrying the rapid transit option on Warren Street and Blue Hill Avenue in conjunction with crosstown service instead of the Midland Option. Anthony Pangaro said that the only thing being dropped now is full scale rapid transit as a branch of the Red Line to South Station. Light Rail on Warren Street/Blue Hill and the Midland line will be kept.
20. Alfred Howard, from the Boston Redevelopment Authority, noted the the high cost of subway in the South End, the conflict between those in the South End wanting additional convenient transit stops and those outside the South End who want express downtown service.
21. Anthony Pangaro asked if anyone had any objections to the consultant's recommendations for Zone 2. There was no response and Mr. Pangaro noted that ... "in Zone 2 the consultant's recommendations have been accepted as the recommendations of this meeting with the addition of the Seaver Street and Washington St. alignments
22. Cecil Brown stated that a light rail option on Columbia Road should be studied in Phase II, running from Grove Hall to Uphams Corner.
23. Clark Frazier indicated his feeling that the Urban Mass Transportation Administration (UMTA) would not fund the project unless a busway is shown in comparison to other systems.
24. Gloria Fox, from the Roxbury/Dorchester APAC, stated that the community should push for what they want regardless of UMTA's position.
25. Paul Porell asked about a connection to the crosstown on the east side of the study area. Anthony Pangaro noted that the busway could connect to Ashmont Station in the east.
26. Clark Frazier suggested that the study look at the possibility of having busses and light rail in the same median.
27. Bill Kuttner asked to what degree the addition of a Washington/Seaver/Columbia Road alignment would "water down" Phase II of the study. Anthony Pangaro said it may cause budget problems and the impact would be examined by the MBTA before proceeding.

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28. In response to a question about dropping rapid transit in Zone 3 on the Midland Branch alignment, Cecil Brown and Gloria Fox both recommended dropping it. Paul Porell and Ken Terrell spoke in favor of keeping it in Phase II of the study because it is centrally located in Zone 3 and relatively inexpensive because of the existing right of way.
29. Clark Frazier felt the decisions to eliminate any alignment proposed by the consultants could not be made because too many people had left the meeting. He recommended not dropping the Midland rapid transit option until its total impact is clear (i.e. land takings for stations, etc.)
30. Gloria Fox indicated that a rapid transit option on the Midland Branch alignment was not acceptable as replacement for the exist-elevated. Anthony Pangaro pointed out that replacement service is provided by any of the proposed options in Zones 1 and 2. In Zone 3, the options provide improvements in service since there is no elevated line in that zone now.
31. A discussion continued about the lateness of the hour. It was felt that the remaining group was not representative and, therefore, no more overall conclusions should be drawn.
32. Clark Frazier suggested solving the rapid transit problem by dropping all Orange Line type vehicles and study light rail technology in a subway to provide rapid transit type service.
33. Anthony Pangaro proposed noting in these minutes that a majority attending wish to drop rapid transit on the Midland branch with Bill Kuttner, Paul Porell and Jim Baecker dissenting.
34. After further discussion, it became clear that the group that was left could not make a decision on whether or not to drop rapid transit on the Midland Branch.
35. The discussion shifted to rapid transit in Zone 1. Clark Frazier suggested that the MBTA put together cost figures that already have been developed. This could be done by MBTA staff in Phase I and would not require any more consultant work.
36. Rose Mehegan mentioned a 1950's study for a subway on Shawmut Avenue. Jorge Hernandez from Inquilinos Boricuas En Accion (IBA), said that a Shawmut Avenue alignment would represent severe problems from development and usage standpoints.
37. Anthony Pangaro indicated that the proceedings of the meeting will require a reexamination of the conclusions and the anticipated schedule for completion of Phase I. He said that an

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additional Project Working Committee Meeting will be scheduled to present the Phase I Report.

A set of tapes of this meeting is available for review by contacting the MBTA project office at 131 Clarendon Street (722-5834)

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Replacement/Transit Improvement Study
 Project Working Committee
 October 26, 1977 Boston City Hospital

<u>Name</u>	<u>Address</u>	<u>Affiliation</u>	<u>Phone</u>
Jim Baecker	City Hall	BRA	722-4300
Gertrude Beldon	176 Glenway St.		265-9577
Rick Bohn	City Hall	BRA	722-4300
Dorothy Bond		Dorch. APAC	288-2700
George Brent	634 Blue Hill Ave.	Charles Drew	436-3000
Cecil Brown	27 Dudley St.	SWCC	427-0035
Hugh Bunte	18 Esmond St.	Grass Roots	436-5915
Douglas A. Butler	316 Huntington Ave.		725-4949
J. Butterworth	682 Mass. Avenue		266-4472
L. Butterworth	682 Mass. Avenue	Worcester Sq. Assoc	266-4472
A.B. Casendino	306 Dartmouth St.	CBT	262-4354
Yong Chang	27 School St.	CTPS	523-3420
William Coleman	92 Bird St.	Fair Share	
Pat Cooke	90 Warren St.	CBT	427-7060
Jim Cooper	214 W. Springfield St.		727-3509
Sally Coyle	5 Worcester Sq.		
John Dean	Mattapan Little City Hall		298-0290
Jean Degnon	31 Worcester St.	4 Squares Neigh.	536-5116
Carlos Diaz	50 High St.	MBTA	722-5214
Sara Driscoll	33 Bourdes Avenue	J.P.	524-3541
Jeffrey Eckber	42 Orkney Road	City of Boston	725-4460
Myron Emanuel	305 Memorial Drive		
Mary Ernst	26 Fabiyan St.		265-1298
Vincent Farrar	30 Vesta Road	Grass Roots	825-3505
Virginia Farrar	30 Vesta Road	Grass Roots	825-3505
Peter A. Fine	92 Waltham St.	8 Streets	426-5876
Rep. Bob Fortes	State House		727-2560
Gloria L. Fox	2249 Washington St.	Roxbury APAC	442-5900
Clark Frazier	29 Union Park	SECOT	482-2148
Barbara Frondel	88 Gainsboro St.	BRA	722-4300
Carole Gang	92 Waltham Street	8 Streets	426-5876
Fr. Francis Gilday S.J.	761 Harrison Ave.		536-8440
Alice Gray	1 City Hall Plaza	BRA	722-4300
Nathaniel Hailey	22 Sussex Street	Roxbury	442-3044
Madeline Hall	110 Floyd Street		436-1156
Inez Hampton	166 Harvard St.		282-0667
Karen Harr	Roxbury	BRA	440-8090
Jean Harrington	44 W. Seldon Street		296-6682
Cynthia Harris	902 Albany Street	Orchid Park Task	442-6876
Jorge Hernandez	12 Rutland Sq.	SEPAC & I.B.A.	262-1342
Ann Hershfang	64 W. Rutland St.		
Leon Hines	64 Crestwood Park		445-7400
Alfred Howard	City Hall	BRA	722-4300
Arthur Howard	976 Blue Hill Avenue		265-3738
Jean Howard	976 Blue Hill Avenue		265-3738
Val Hyman	20 Union Park	Dorch. Fair Share	266-5451

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<u>Name</u>	<u>Address</u>	<u>Affiliation</u>	<u>Phone</u>
Craig Inge	94 Woodrow Avenue	GRDC	440-9090
Earleen Jackson	100 Northampton St.		442-3487
George Jackson	35 Northampton St.	MIT	353-1524
Dorothy Jones		BHA	
Dennis Kalla	37 Worcester Street		262-6436
Bessie Kieth	77 Floyd Street		
Donald Kerr	96 W. Concord Street	4 Squares	267-6743
William A. Koelich	23 Union Park	Union Park Neigh.	426-6186
Bill Kuttner	14 Alleghany St.		442-5316
Ralph LeBeau	City Hall	BRA	722-4300
Robert Lepore	850 Boylston St.	TAMS	731-1550
Lin Loughheed	322 Shawmut Street		267-3080
Barbara S. Lung	114 Pleasant Street	Brookline	
Richard Lung	15-17 E. Springfield St.		277-0016
Alfred Mackiewiz	7 Whittemore Terr.	Dorch. Fair Share	436-6438
Vaughncille Molden	27 Roxbury St.	OPS Mayer's Off.	725-3166
Albert Martin	902 Albany Street		442-6876
Paula Mateus	11 Moreland St.	Mayor's Office	725-4850
James McCowell	12 Nottingham St.	Fair Share	
Rose Mehegan	5 Worcester Square		
Joan Metz	94 Waltham Street		542-7937
Peter Metz	94 Waltham Street		
Frances K. Moore	31 E. Springfield St.		267-4589
Dr. Henry Morier	5 Worcester Square		536-2898
Herman C. Morris	20 Ellington St.	Charles Drew	436-3000
M. Parham	27 Dudley St.	SWCC	427-0035
Thom Payne	P.O. Box 549	1st. Church Rox.	445-8393
Roz Pennick	31 State Street	City Hall	725-3112
Joe Perez	25 Ruggles Street	CDC of Boston	442-2116
Marjorie Perry	53 Kingsdale Street	Grass Roots	424-5112
Paul Porell	Boston City Hall	BRA	722-4300
Barry Porter	850 Boylston St.	TAMS	731-1550
Glenn Porter	791 Tremont Street	S.C. Fuller	266-8800x301
		Mental Health Ctr.	
L.V. Randolph	90 Warren Street	GRDC	440-8090
Melanie Ray		Mayor's Office- OPD	725-3455
Donald Roach	30 Mallon Road		725-3270
Billie Rogers	141 Desmond Street		296-5536
Alan Root	80 W. Dedham Street		542-0620
Polly W. Russell	27 Dudley Street	SWCC	427-0035
Wayne Sherwood	54 E. Springfield St.		353-0803
Fay Siegfiedt	1020 South Street	Roslindale	
Shirley Simpson	45 High Street	Ⓟ	722-5000
Catherine H. Smith	191 Norwell St.	Dor. Fair Share	825-5442
Peter Smith	90 Warren St.	CBT	427-7060
Al Sopyla	27 School Street	CTPS	523-3410
Joyce Stanley	159 Cedar Street		
George J. Steiff	33 Bradston St.		442-1233
Norman Stenbridge	1 Circuit Square		434-4753
Angela Swanson	35 Northampton	Boston City Hosp.	424-4872
Kenneth Terrell	418 Bowdoin St.		288-4266
Dick Tilles	850 Boylston St.	TAMS	731-1550
Jack Toby	35 Union Park		482-6872
Irene Trayer	21 Eisenhower Rd.	Framingham	

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<u>Name</u>	<u>Address</u>	<u>Affiliation</u>	<u>Phone</u>
Regina Vaiciulenas	111 Wheatland Ave.		
Wendall Verrill	75 Union Pk.	21 Centro Del Cardenal	542-9292
Jimi Vincent	Cambridge	WFEM	864-3500
John T. Walker	150 Am. Legion Hgwy.	Lena Park CDC	288-4900
James Ware	208 W. Canton St.	Central YMCA	526-6950
Mark Weiss	2 Park Square	MA Law Reform	482-0890
Edna White	64 Ormond Street		298-2851
Gene Wright	18 Elm Hill Park		427-4258
Bob Young	150 Am. Legion Hgwy.	Lena Park CDC	288-4900
Anthony Pangaro	131 Clarendon St.	(T)	722-5834
Peter Calcaterra	131 Clarendon St.	(T)	722-5834
Ken Kruckemeyer	12 Holyoke Street	(T)	722-5834
Dan Ocasio	177 W. Newton St.	(T)	722-5834

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MINUTES OF PROJECT WORKING COMMITTEE MEETING

DATE: January 31, 1978

PLACE: Prince Masonic Hall, Grove Hall

TIME: 7:00 P.M. to 9:40 P.M.

PRESENT: See attached list

1. Peter Calcaterra, Replacement/Transit Improvements Study project manager for the MBTA Southwest Corridor Office, described the scope of the Study and the conclusions reached during Phase I. He noted that the purpose of the meeting was to review the results of the first phase, discuss why certain options had been dropped during Phase I and what steps were required to enter into Phase II of the Study. He briefly described the concepts of replacement service and transit improvement, the four zones of service in the study area, the reasons for ruling out rapid transit and discussed items that will be requiring further analysis in Phase II. He went on to describe the panel format of the meeting and to indicate that the panel had been recommended by community participants in the Friday Coordinating Committee Meeting. Mr. Calcaterra solicited comments from members of the panel.
2. Clark Frazier, from the South End Committee on Transportation (SECOT), discussed the study from the perspective of the South End. He said that the work in Phase I had reduced the alternatives to a few, realistic options and that during Phase II the community will be able to react to the details of these options as will be developed by the consultants, and the community can thus concentrate on such issues as development along Washington Street. He mentioned that the speed of the Study's execution and with which the replacement service can be implemented was critical to residents of the South End since the Washington Street Elevated will be coming down in 1983. He indicated general support of the Study findings and he thought missing details would be worked out in Phase II.
3. Ralph Agee from the Roxbury Multi-Service Center, said he had been concerned throughout the study about the community participation process. He noted that he is now satisfied that the community has had an opportunity to be heard and to contribute in Phase I. He emphasized the importance of initiating Phase II without delay so as to make sure that replacement service and transit improvements can be in place when the Main Line corridor reconstruction is completed.

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January 31 Meeting Notes

4. Mike Parham from the Southwest Corridor Coalition and a resident of Zone 2, stated that he also felt the community has had access to the process and called for continuing participation and support during Phase II when the selection of a preferred alternative will finally be made. He noted that he was in accord with the alternatives selected for Phase II analysis.
5. Shirley Campbell chairperson of the Transportation Committee of the Blue Hill Avenue Commission, said that the Commission can serve as a conduit between the community and the MBTA to insure that what is finally implemented is what the community wants. She stated that she was available to give information to community people about transportation options on Blue Hill Avenue and that she could be reached at 725-3181 or at 460 Blue Hill Avenue.
6. Sue Clippinger from the Office of the Mayor's Transportation Advisor, supported the recommendations made in the Phase I Report and described the City's role in working with the areas involved. She stated that the City's policy is to reinforce neighborhood commercial centers such as Dudley Square, Uphams Corner, Grove Hall and Mattapan Square. The City also wants to insure that a trolley replacement service in the South End is in place when the Elevated comes down. There is great interest as well in the Crosstown segment (Zone 4) from Columbia Point to Northeastern. Finally, she said that she did not believe that the City had a clear sense of what should happen south of Dudley and that, as Phase II focuses on that issue, the City will look towards the Blue Hill Avenue Commission and other groups in the area for guidance on what's important as far as development and what type of transit improvements people want.
7. Mr. Calcaterra opened the floor to questions. Several people asked about recent problems with bus services. Carlos Diaz MBTA Manager of Consumer Relations, spoke about the issues addressed, mentioned the survey of three bus routes conducted during Phase I and improvements that had been realized, and stated his commitment to investigate problems and to propose improvements in the existing service.
8. Catherine Smith from Dorchester Fair Share and the United Concerned Neighbors Association, asked about enclosing Ashmont Station and complained about the service on that line. She asked what was going to be done about the existing service and said that improving it was more important to her than any of the new systems being talked about at the meeting.

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Mr. Diaz encouraged people from the community to stay involved and to continue to inform the MBTA of poor service. He noted that if armed with specific information, he will be much more effective in getting changes implemented to improve the existing service in the study area. Mrs. Smith suggested that she would like to go with Carlos the next time he does a bus survey.

9. Bill Kuttner from Mission Hill, asked how many plows the MBTA owns for various lines and how old they were. It was noted that several lines do not have plows and that the equipment is very old.
10. Hugh Bunte from Mattapan, noted that during the recent storm buses were operational. He thought that they were best from Dorchester and Mattapan. He also noted that money for fixed rail vehicles should be limited to downtown systems and buses used elsewhere.
11. Rick Grey from the Greater Roxbury Development Corporation, asked where the study stands in relation to subways or tunnelling. Mr. Calcaterra responded that subways will be studied in sections where safety, traffic and land takings warrant it. Mr. Grey asked that, if it becomes necessary to evaluate tunnelling along the whole length of Blue Hill Avenue, will that be done during Phase II? Mr. Calcaterra indicated that such would be the case, if necessary, for the reasons previously cited.
12. Beatrice Williams from the South End, asked about the cost of subways. She understood that the costs from subways were prohibitive. Mr. Calcaterra confirmed that tunnelling costs were high. However, he reiterated that tunnels will be studied in segments where surface solutions are either difficult or do not provide adequate safeguards to pedestrian movements.
13. Herman Wells of the Federal Aviation Administration and from the Community Betterment Association, asked why an Urban Mass Transportation Administration (UMTA) representative was not present at the meeting. He said that his group is in favor of a subway from Mattapan to downtown. He also indicated concern that the public solicitation by the MBTA for snow shovelers during the recent storm to report to South Boston was not conducive to encouraging minorities to show up. Mr. Diaz said that the Arborway was announced as an alternate location for shovelers but that it was not as well publicized as South Boston. Mr. Calcaterra indicated that there was no need for UMTA representatives to

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attend the meeting tonight. UMTA will receive copies of the Study's reports and minutes and will be a participant at the hearings which would follow at the end of Phase II of the study.

14. Ken Terrel from Dorchester, noted that many years ago the MTA and not the City had the responsibility for plowing the streets after a snow storm. He asked that the light rail options be totally in a subway from one end to the other and that they include a third track for express service. Mr. Calcaterra noted that this would be exceptionally expensive and that demand did not warrant the capacity provided by this type of service.
15. Bill Kuttner asked if anybody had considered using a new sales tax to fund transit systems and not use Federal funds. Mr. Wells indicated that money for airport construction is always available from a trust fund whether needed or not. He stated that funds are also available from UMTA for transportation and that even though we may not get what we want, whatever we get will not require new taxes. Ms. Clippinger noted that if new taxes were developed, people would probably want to use the revenue to relieve property taxes rather than build new transportation systems. Dick Tilles, project manager for Tippetts-Abbett-McCarthy-Stratton (consultants for the study), stated that regardless of how much money is eventually available from UMTA, residents of the study area would benefit more from building a series of busway or light rail lines than from a single rapid transit line. Tony Pangaro, MBTA Manager of Southwest Corridor Development, said that Federal funds for transit construction are very limited. While the money to build airports and highways comes from trust funds which collect captive taxes such as highway and excise taxes, no such trust fund exists for transit construction. As a result less money is available to build mass transit systems every year, whereas the airport and highway trust funds continue to grow. He encouraged anyone interested in doing so to lobby for making Federal funds available for transit construction and operations.
16. Bob Haas from Uphams Corner, was concerned that rapid transit has been dropped on the Midland Branch. He noted that Dudley Street was too congested to consider it as an acceptable route from Uphams Corner to downtown. Mr. Tilles said that land takings, subway sections or an alternate route would be considered to relieve the congestion of Dudley Square and Uphams Corner. Mr. Haas asked if it were possible to have a service from Uphams Corner directly to downtown.

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Mr. Frazier pointed out that this approach would be possible if the proposed plans to depress the Central Artery and build a transit connection between South and North Stations materialize. Mr. Calcaterra indicated that if that connection is built the service would more likely be an extension of commuter rail.

17. David Ransom from the South End, asked about commuter rail service on the Midland Branch during reconstruction of the Orange Line. Mr. Pangaro stated that the interim service (during construction of the relocated Orange Line) will run about every half-hour during rush hour stopping at three stations: Uphams Corner, Morton Street, and Fairmount St. in Hyde Park. This service will be on a 90 day trial basis. New lighting will be provided and the City of Boston has agreed to provide police and maintenance services.

Mr. Ransom asked if Franklin Park was part of the study area. Mr. Calcaterra confirmed that the area was definitely part of the study.

18. Mr. Calcaterra noted that additional comments on the results of Phase I from the community are encouraged and that those received prior to February 7, 1978 will be bound into the Phase I Report which will be submitted to UMTA.
19. Mr. Kuttner asked if bus service between Uphams Corner and the Back Bay could be made part of the interim service on the Midland Branch. Mr. Pangaro said that the route was not good because of a poor street system but that there will be a temporary rail shuttle connection between South Station and the Back Bay for the interim service during construction of the relocated Orange Line.
20. Beatrice Williams from the South End, asked what will replace the Elevated to downtown. Mr. Frazier described the busway and light rail options on Washington Street that will be studied during Phase II.
21. Ed English from Roxbury, asked if any decisions were being made at this meeting. Mr. Frazier answered that all the rapid transit options had been dropped and that final selection of a preferred alternative would be made at the end of Phase II. Mr. Calcaterra stated that Phase II will take approximately eight months to complete after authorization to proceed is received from UMTA. Mr. English asked what communities have participated in the study. Mr. Calcaterra said that there has been a fairly even participation from

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- all the neighborhoods in the study area and that the mailing list includes over 1700 names. In addition many meetings had been held with local groups. Mr. English asked what the MBTA's system to handle complaints about the existing service was. Mr. Diaz described the system and gave his phone number 722-5216 or -5214.
22. Shawn Moore from Dorchester, asked why the existing service can't be better and that he has had experience with buses passing his stop. Mr. Diaz said that he would like to get more information after the meeting about the specific problems from Shawn.
 23. Laverne Randolph from Greater Roxbury Development Corporation, suggested that the MBTA should commit itself to improve the existing service during Phase II to demonstrate its intent to the community.
 24. Sister Bessie from Dorchester, said that she considered it a "low blow" to be asked to stand on street corners and write down bus numbers to help the MBTA improve service. Mr. Diaz agreed that problems with bus services cause frustrations among riders. Mr. Parham emphasized that cards and letters with specific details were very necessary and will have a lot of impact on those that make decisions at the MBTA and will help Carlos in his efforts to have present problems corrected.
 25. Mr. Calcaterra adjourned the meeting at 9:40 P.M. with thanks to the panelists and to those who attended.

Replacement/Transit Improvement Study
Project Working Committee
January 31, 1978 Attendance

<u>Name</u>	<u>Address</u>	<u>Affiliation</u>	<u>Phone</u>
Mr. E. Shabazz Hasan	649 Warren St.	Mr. X's Unisex Salon (Grove Hall)	427-9216
Bill Kuttner	14 Alleghany St.	Roxbury Crossing (SATF)	442-5316
Paula Waters	Boston City Hall Room 608	Deputy Mayor Jones' Office	725-4851
Willie Grant	75 Morton Village		
Melanie Ray	Boston City Hall Room 808	O.P.D.	725-3455
Shirley Campbell		Blue Hill Ave. Commission	725-3181
Kenneth Terrell	418 Bowdoin St. Dorchester		288-4266
Stephen C. Farrell	540 Mass. Ave. Boston		262-3841
Alice Gray	1 City Hall Plaza	BRA	722-4300
Herman Wells	19 Harlem St. Dorchester	Community	273-7314
Leon V. Jacklin	City Hall	BRA	722-4300
Regina Vaiciulenas	111 Wheatland Ave. Dorchester		265-5787
Mary Vann	82 Armandine St.	B.E.H.I.P.	424-5934
Gloria L. Fox	2249 Washington Roxbury	APAC	442-4900
Ed English	321 Marlboro St.	RMA	492-2050
Craig M. Inge	90 Warren St.	GRDC	445-4242
Elise L. Hill	90 Warren St.	GRDC	445-4242
S. P. Brennan	Brookline	TAMS	731-1550
L. V. Randolph	90 Warren St.	GRDC	445-4242

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<u>Name</u>	<u>Address</u>	<u>Affiliation</u>	<u>Phone</u>
Donald Roach	30 Mallon Road Dorchester		725-4850
A. Anthony White	9 Nazing St. Roxbury		725-3479
Tommie J. McCall	26 Greenbrier St. Dorchester		
Wilma Munroe	17 S. Charlame Ct. Roxbury		445-8646
Thomas Wooten	28 Elm Hill Pk. Boston		427-4608
Richard Kemp	685 Oak Street Brockton		587-1537
Robert H. Haas	29 Monadnock St. Dorchester	Virginia-Monadnock St. Civic Association	436-0494
Peter C. Calcaterra	131 Clarendon St.	MBTA	722-5834
Sue Clippinger	City Hall	Mayor's Office	725-4490
Mike Parham	SWCC		524-3969
Dick Tilles	TAMS		731-1550
Carlos Diaz	50 High St.	MBTA	722-5214
Bruce C. Bolling	972 Blue Hill Ave.	Little City Hall	287-0172
Paul Porell	BRA		722-4300
Beatrice Williams	28 Union Park		536-4575
Karen Harr	City Hall	BRA	722-4300 Ex. 3
Alfred Howard	City Hall	BRA	722-4300 Ex. 270
Sis Bessie X	77 Floyd St. Dorchester		
Rick Grey	90 Warren St.	G.R.D.C.	445-4242
Rod Parker	306 Dartmouth St.	CBT	262-4354
Roscoe Morris	Little City Hall Roxbury		442-3510
Leon Stenhaus	59 Tennis Rd.		427-9665

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<u>Name</u>	<u>Address</u>	<u>Affiliation</u>	<u>Phone</u>
Edward Ballo	74 Waltham St.	South End	
Richard Richardson	24 Washington St. Dorchester		445-1145
Shirley Simpson	45 High Street Boston	MBTA	722-5878
Leonard W. Christian	104 Greenwood St. Dorchester		
Barbara S. Lung	114 Pleasant St. Brookline	South End	277-0016
Leon McGinnis	117 Regent St. Roxbury		
Ralph Agee	317 Blue Hill Ave.	R.M.S.C.	427-4470
Clark Frazier	29 Union Park	SECOT	482-2148
Peter H. Smith	306 Dartmouth St.	CBT	427-7060
William T. Baker	55 Bicknell St.	BRA	722-4300
Barry Porter	850 Boylston St.	TAMS	731-1550
Ron Nayler	City Hall	BRA	722-4300
Elise Martin	30 Worcester Sq.		353-0017
David Ransom	38 Dwight St.	Taxpayer and Transit User	426-3609
Anthony Pangaro	131 Clarendon St.	MBTA	722-5834
Catherine H. Smith	191 Norwell St.	Dorchester Fair Share	825-5442
Jim Baecker	City Hall	BRA	722-4300
H. Bunte	18 Esmond St. Dorchester	C.W.C.J.E.	436-5915
Robert Lepore	850 Boylston St.	TAMS	731-1550
Cecil L. Brown	27 Dudley St.	SWCC	427-0035
Walter Little	460 Blue Hill Ave.	Grove Hall Council	442-4465
George M. Williams	90 Warren St.	GRDC	445-4242

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<u>Name</u>	<u>Address</u>	<u>Affiliation</u>	<u>Phone</u>
Frank Sylvester	141 Ormond St.	B.W.H.I.P.	424-5935
Ted Landmark	532 Mass. Ave.	MBTA	495-1928
Gloria Moore	306 Dartmouth St.	R/ITS	427-7060
Anthony B. Casendino	306 Dartmouth St.	R/ITS	262-4354
Shawn A. Moore	110 Floyd Street		
Andrew Jenkins	8 Harlem St.	HUD	223-4715
Ralph LeBeau	City Hall	BRA	722-4300
Greg Dunham	37 E. Concord St.	Resident	

MINUTES OF PROJECT COORDINATION MEETINGS

APRIL 15, 1977

Attendees at the first open coordination meeting for the Replacement/Transit Improvements Study were:

Peter Calcaterra	MBTA
Ken Kruckemeyer	MBTA
Tony Casendino	CBT
Dick Tilles	TAMS
Clark Frazier	S. End
Ralph Parto	SWCC
Sue Clippinger	Mayor's Office
Andy Jenkins	CBT
Yong Chang	CTPS

Dick Tilles opened the meeting by handing out copies of 1) a draft memo on evaluation criteria, 2) a list of alternatives identified to date, and 3) outlines for technical memos on service analysis, technology analysis and right-of-way analysis. He requested comments on these at next Friday's meeting.

Ken Kruckemeyer said that TAMS should prepare a preliminary analysis of as many alternatives as possible for the May 10 Project Working Committee Meeting. Peter Calcaterra said that we should use as much previous material as possible.

Dick Tilles raised a question about the disparity of performing detailed engineering work for some alternatives (notably the light rail line in the South Cove area) while concurrently analyzing transportation service alternatives on a very preliminary basis throughout most of the study area. Clark Frazier and Ken Kruckemeyer said that the engineering work in South Cove was required to come up with an alternative acceptable to both South End and South Cove neighborhoods to prevent political opposition from surfacing early in the study.

The description of alternatives were briefly looked at and it was suggested that alternatives be developed as an outgrowth of travel desires. Clark Frazier suggested that this indicated connecting major commercial centers in the area such as Dudley, Grove Hall, Mattapan, etc. Dick Tilles said he would try this approach for the next meeting.

We then went over the evaluation criteria. Ken Kruckemeyer suggested that regional goals be included as part of overall community goals. It was suggested that community goals be placed first on the list of criteria. Clark Frazier said that capital costs should be evaluated on an annual capital cost basis as well as first cost so that longer lasting equipment would be more fairly evaluated. He also said that operating costs should be looked at from a standpoint of what is achievable as well as current conditions. This provoked considerable discussion concerning realistic appraisal of operations. The question of Central Subway capacity was raised as an example and it was suggested that the MBTA conduct a realistic appraisal of future capacity.

Yong Chang said that he would present data on trip desire lines at next Friday's meeting. He said that he and Dick Tilles would get together next week to review CTPS' population projections which Dick Tilles said did not take into account differential neighborhood growth in the City of Boston. Clark Frazier said that the community would be loath to accept any forecasts of population decline in the City. Dick Tilles said that the study's credibility depends on forecasts which are reasonable and that community goals alone cannot populate the City.

Yong Chang said that the CTPS model does not take into account the impact of transit alternatives on population and economic growth. He said that the sensitivity of the model was such that this shortcoming would not affect ridership forecasts significantly. Dick Tilles said that some method (even manual adjustment) would seem essential to reflect the impact of transportation alternatives on growth. Yong Chang said that ridership should not be an important factor in first stage evaluation of alternatives.

Sue Clippinger said that Tom Pelham in Sue Richardson's office had made an evaluation of bus vs light rail on the Watertown line and that these data would be useful for the Replacement Study. Peter Calcaterra said that he would contact Sue Richardson for this information.

APRIL 22, 1977

Attending the second open project working committee meeting were:

Peter Calcaterra	MBTA
Susan Richardson	MBTA
Paul Porell	BRA
Cecil Hansel	Roxbury
Clark Frazier	South End
Michael Hawkins	SWCC
Yong Chang	CTPS
Dick Tilles	TAMS
Sue Clippinger	Mayor's Office
Andy Jenkins	CBT (Roxbury)
Tony Casendino	CBT
Lydia Mercado	Uphams Corner-District Planner

1. Peter Calcaterra said that Secretary Salvucci has been formally asked by Tony Pangaro to attend the May 10th Project Working Committee meeting.

2. Tony Casendino summarized major community concerns he has been hearing at meetings as follows:

- (a) The study needs a major commitment by big state and city authorities.
- (b) The community is still confused on how the study fits into overall SW Corridor development.
- (c) People are not anxious to go to meetings unless shown some concrete alternatives to which they can react.
- (d) Most community suggestions at this point concern service problems.

3. Problems in addressing our study to local community concerns were discussed at length. Sue Richardson said that people with specific service complaints should call 722-5700. Also, Sue said that she could give us complaint forms (which now are distributed only at the T) to give to persons who raise specific problems at the meetings. Also, we should summarize concerns which are heard frequently and send them via memo to Sue, Ron Tober and Dave Gunn.

4. Tony Casendino said that many questions have been raised about whether or not stops would be put on the Midlands Branch while interim commuter rail service is running between 1979-1983. Peter Calcaterra said that stops will definitely not be put in; the FRA would not allow stops. Clark Frazier said that having one or two trains a day with stops in the area would not serve the community and only raise false hopes. Lydia Mercado said that some Uphams Corner people have actually said they're happy to see trains, even if they don't stop, as a sign of activity in the area.

5. Sue Richardson said that some community-run para-transit services could be useful in parts of the study area. However, the T will not fund services which compete with regular bus lines. She said that mini-buses have been a disaster for the MBTA and have ended up with higher operating costs than regular buses because of maintenance problems. Sue Clippinger said that para-transit services might be oriented around the taxi industry.

6. Yong Chang presented maps showing 1975 travel desire lines for internal and external trips. Trips originating in the study area were as follows:

- (a) Destinations in study area - 18%
- (b) Destinations inside Route 128 - 71%
- (c) Destinations outside Route 128 - 11%

Yong said these were based upon the A. M. Voorhees gravity model trip distribution. School trips were not included. Yong explained that the results of the gravity model analysis were adjusted by applying "K" factors where theoretical results did not match actual ground counts.

7. The following comments were made about the travel analysis:

- (a) Trips from each neighborhood to all other areas should be shown on separate maps.
- (b) An "error" factor should be stated to explain how accurate the numbers are (Michael Hawkins).
- (c) "K" factor analysis should be made public (Michael Hawkins).
- (d) It didn't appear that enough daily trips were generated (Clark Frazier).
- (e) Trips should be adjusted depending on future land use development (Michael Hawkins).
- (f) Trips should be adjusted based on transportation alternatives (Clark Frazier and Dick Tilles).
- (g) School trips must be included.
- (h) These data must not be used alone, but be shown in conjunction with travel information we get from the community (Sue Clippinger).

8. Michael Hawkins said that any transportation analysis must be performed in conjunction with the City's policy on development of the area. We need someone from the City to state this policy.

9. Dick Tilles said it was important that trip information be agreed upon at the coordinating meeting level because it was too complicated to present at project working committee meetings.

10. Peter Calcaterra said the next coordination meeting should primarily be concerned with what is prepared for the May 10th meeting. Dick Tilles handed out a preliminary drawing showing an analysis for that meeting. It was commented that some sort of circumferential line must be included in this analysis, even if it is not costed out.

APRIL 29, 1977

Attendees:

Andrew Jenkins	CBT	Don Kidston	MBTA Planning
Paul Porell	BRA	Dick Tilles	TAMS
Clark Frazier	South End	Peter Calcaterra	MBTA Southwest
Peter Fine	South End	Ken Kruckemeyer	MBTA Southwest
Pat Brennan	TAMS	Sue Richardson	MBTA Marketing
Jim Baecker	BRA	Jaci Hall	WFEM
Yong Chang	CTPS	Sue Clippinger	Mayor's Office
Ron Tober	MBTA Operations	Bob Lis	BAC
Cecil Hansel	Roxbury		

1. Yong Chang discussed CTPS' schedule for getting ridership forecasts. Their transit network should be ready next week, and it will take two additional weeks to validate the model. This means that the two base case alternatives would be run in late May and other alternatives could be programmed in early June.

2. Clark Frazier asked how the MBTA's projected ridership goals were taken into account in the model. Peter Fine asked how future development projects such as proposed Blue Hill Avenue redevelopment were incorporated. Dick Tilles said that ridership forecasts should reflect the impact of a new service on development as alternatives become better defined. Peter Fine said it should be made clear that this element is not now taken into account in ridership forecasts.

3. Yong Chang and Don Kidston explained that the modal split portion of the model incorporates characteristics from the entire Boston metropolitan region.

4. Tony Casendino said that mode choice appears to be influenced by the community's perception of service. For example, people remember bad experiences and this colors their image of the T and hence their mode choice. People using the Ashmont line don't like to see better service being provided to Quincy.

5. Yong Chang said that the model would be adjusted if transit/highway volumes did not match actual counts. Paul Porell asked if unadjusted results could be presented to the group, and Yong Chang agreed to do so.

6. Dick Tilles presented a chart showing the process of selecting alternatives in Phase I. Peter Fine said that all alternatives presented to the community must be simple. Clark Frazier said that we should show connections to centers, at least at a later date. Ken Kruckemeyer said that we must show a crosstown link.

7. Short range service changes were discussed. Don Kidston said that CTPS has a new short range service planning model that could be used to roughly evaluate changes. Clark Frazier said that putting buses into service is the best way to determine impact. He said that it might be useful to test a Washington St. bus to downtown. Sue Clippinger said that such a service should not be started until the downtown transit loop is in operation. Clark Frazier said that bus routes should be longer with shorter layovers. Don Kidston said that layovers give a driver a chance to get back on schedule. Sue Richardson said that we should come to her group with a package of short term recommendations at some point in time.

8. Clark Frazier said that new service should include transfers or zone fares. Sue Richardson said that transfers have been abused so often that the T doesn't like them.

9. Peter Calcaterra said that Secretary Salvucci and BRA Chief Bob Walsh are expected at the May 10 project working committee meeting.

10. Clark Frazier said that material for the May 10 meeting should be previewed at next Friday's coordination meeting.

11. Dick Tilles asked how decisions get made at working committee meetings. Sue Clippinger said that the consultant asks for a consensus to drop alternatives. Ken Kruckemeyer said that it is important that all dropped alternatives be well documented. Sue Clippinger said that the consultant should inform people at coordination meetings of any further work done on alternatives that have been dropped.

12. Tony Casendino suggested that the June project working committee meeting be held in a different location, perhaps on a Saturday morning.

MAY 6, 1977

Attendees:

Andrew Jenkins	CBT/TAMS
Paul Porell	BRA
Clark Frazier	SECOT
Dick Tilles	TAMS
Bob LePore	TAMS
Tom Humphrey	EOTC
Al Sopyla	CTPS
Paul Thorn	TAMS
Peter Calcaterra	MBTA Southwest
Ken Kruckemeyer	MBTA Southwest
Tony Casendino	CBT
Peter Smith	CBT
Michael Hawkins	SWCC
Stephen Clark	CTPS

1. The meeting was devoted primarily to a review of material proposed to be handed out at the May 10 Project Working Committee meeting.

2. Clark Frazier commented that the costed systems are misleading in that more capacity and different speeds could be provided, and stations could be spaced differently. He said that the term "rapid transit" implies that it is faster than "light rail" which is not necessarily true. Dick Tilles explained that the assumed systems were based on service characteristics for similar services operated on the MBTA. It wasn't perfect, but it was a starting point. It was generally agreed that characteristics such as speed, station spacing, headways and such would be downplayed in the presentation by not putting these numbers on a matrix evaluation chart.

3. Michael Hawkins said we should not get into too much technical detail because it would not be understood. He also felt that the public needed to be educated on the pros and cons of each transportation mode. He said that cost would not be of much interest to the community unless it was reflected in increased fares. If \$700 million is being spent in Cambridge, why not also spend it in Roxbury?

4. Michael Hawkins said that we have to talk about process and explain what happens at Friday meetings as opposed to what happens at Project Working Committee meetings.

5. Al Sopyla handed out draft copies of CTPS' market analysis and requested that it be reviewed.

MAY 13, 1977

Attendees:

Andrew Jenkins	TAMS/CBT	Sue Clippinger	Mayor's Office
Paul Porell	BRA	Peter Calcaterra	MBTA Southwest
Jim Baecker	BRA	Dick Tilles	TAMS
Clark Frazier	29 Union Park	Tony Garcia	TAMS.
L. V. Randolph	GRDC	Calbert Booker	Matt. Civic Comm.
Al Haynes	State House	A. Casendino	CBT
	(Rep. Mary Goode)	Gwen Simmons	CBT
Ken Kruckemeyer	MBTA Southwest	Rod Parker	CBT
King Harvey	John Brown Assoc.		
John Brown	John Brown Assoc.		
Ralph Agee	RMSC		

1. The first part of the meeting was devoted to a discussion of study area land use. John Brown Associates (JBA) has prepared a draft technical memorandum on study area land use, and John Brown and King Harvey of JBA delivered a talk on its contents. Dick Tilles said that he would send copies of the memorandum to those at the meeting.

2. John Brown explained that the memo looks at general land use and does not address specific alternatives; that will come later in the study. He is beginning work on developing criteria for evaluating land use impacts.

3. Clark Frazier said that a map of population density should reflect 1975 data, not 1970 U.S. census data. Paul Porell suggested that the ward/precinct map from the 1975 state census be used. John Brown said he would rework the map with such data.

4. Ken Kruckemeyer said that we must make sure all maps are O.K. before they are presented to the general public. He said that we should be thinking about how graphics should be reproduced in the final report. Tony Casendino said that Ralph LeBeau is preparing 400 scale maps of the City which might be helpful.

5. King Harvey showed a map depicting current/potential land use problems. Sue Clippinger said that the "problems" map is a problem in itself. It is very subjective and might contain the makings of a self-fulfilling prophecy. Ralph Agee said that we need to know criteria for making such decisions. There was a consensus that the map should not be shown to the public.

6. Clark Frazier said that a study should be made of the impact of heavy auto and truck traffic on residential streets. He said that the impact of alternatives on the City's tax base should be evaluated. John Brown said that residential stability is an obvious goal for much of the study area and was not necessarily directly related to the tax base.

7. Jim Baecker discussed the BRA's role in the area. He said that declining commercial areas foster adjacent residential decline. The BRA's strategy for thoroughfares like Blue Hill Avenue was to get away from strip commercial development and concentrate on upgrading commercial "nodes" at major intersections such as Grove Hall and Mattapan Square. He said that the BRA is trying to get federal Urban Development Action Grant (UDAG) funds for a number of parts of the study area.

8. Specifically on Blue Hill Avenue, a commission is being formed, and it probably will be year before any real policy recommendations come out of this. The BRA has halted a study on Blue Hill Avenue traffic improvements until results of our study become clearer. Clark Frazier said that any reconfiguration of upper Blue Hill Avenue should consider a possible transit median.

9. Tony Garcia of TAMS presented a preliminary engineering feasibility and cost analysis of running a light rail vehicle from the Green Line on Tremont St. to Washington St. in the South End. He looked at four basic schemes:

- a. A tunnel under the Orange Line South Cove tunnel (from BTPR)
- b. An at-grade line down Shawmut Ave. (from BTPR)
- c. A line surfacing on Marginal St. and running at-grade across the Mass. Tpke.
- d. A line surfacing in front of the Don Bosco School and running at-grade down either Washington St. or the R.O.W. of the current Orange Line elevated.

10. Preliminary comments were that alternatives "c" and "d" appeared to provide a reasonable compromise between the costs of "a" (estimated at 52 million) and the access and noise problems associated with "b".

11. Dick Tilles suggested that these materials be looked at by the MBTA Southwest staff while Tony is out of the country (2 or 3 weeks). Ken Kruckemeyer said he would like to check some of the grades used in these schemes.

12. Scheme "d" included a connection to the South Cove Orange Line station. It was suggested that all schemes include costs for such a connection.

MAY 20, 1977

Attendees:

Peter Calcaterra	MBTA Southwest	Dick Tilles	TAMS
Ken Kruckemeyer	MBTA Southwest	Bob Lepore	TAMS
Susan Richardson	MBTA Community Affairs	Tony Casendino	CBT
Peter Lynch	MBTA Community Affairs	Rod Parker	CBT
Clark Frazier	South End	Andrew Jenkins	CBT-Roxbury
Michael Hawkins	SWCC	Jim Baecker	BRA
Cecil Hansel	Roxbury	Peter Smith	CBT
Yong Chang	CTPS		

1. A questionnaire for a survey of transit riders at selected Orange and Red Line stations was handed out. Clark Frazier said that it would be biased because it wasn't sampling persons who only use buses and persons who don't now use the Orange Line but might if it were more convenient. Ken Kruckemeyer explained that it is important to pick up bus riders and that this would be done in October when the T performs a system-wide survey. For now it was too expensive and time-consuming to survey bus riders and particularly non-riders (who would require a home interview).

2. Dick Tilles explained that the survey primarily was intended to determine origins and destinations of current riders. Current CTPS data are based on 1963 home-interview surveys and are way out of date particularly in the Study Area. Just finding out characteristics of current riders is important in planning a replacement system. The fact that non-riders are not surveyed does not mean they will not be included in future ridership projections.

3. Clark Frazier said that critical bus routes such as Mass. Ave. and Blue Hill Ave. routes be surveyed anyway. He said the survey was important enough and controversial enough to run through the Project Working Committee on Tuesday night. Michael Hawkins agreed and said that if possible it should be reviewed by major groups such as SWCC and SEPAC. He said that it was unwieldy to run it through the PWC, but no other policy making group was available.

4. Immediate bus improvements were then discussed. Susan Richardson said that it would be most helpful if specific bus route changes could be presented to her. Tony Casendino said that most people don't want changes, they just want constant schedules and buses that adhered to them.

5. Questions were brought up pertaining to the MBTA's quarterly schedule changes. Susan Richardson said that these changes were made to permit small scheduling changes to be made when deemed necessary by the schedules department. Clark Frazier said that a constant schedule would permit easy compilation of all routes into a book. Also, it would facilitate posting of schedules at stops. Susan Richardson said that schedule changes should be publicized better.

6. Michael Hawkins suggested that Susan Richardson talk to people at meetings to find out what their problems were. Susan said that the RTIS had been doing just that and was a more appropriate source of information.

7. Clark Frazier said that MBTA policy should be that night bus service run no less frequently than 1/2 hour. He also said that the #49 and #68 bus lines were too short and should run to Dudley. He also said that lack of a free transfer leads to inequities.

8. Peter Calcaterra handed out a proposed working committee procedures memorandum which was developed from the one used for the Southwest Corridor project. The remainder of the meeting was devoted to reworking this memo.

MAY 27, 1977

Attendees:

Peter Calcaterra	MBTA Southwest
Ken Kruckemeyer	MBTA Southwest
Clark Frazier	South End
Cecil Hansel	Roxbury
Yong Chang	CTPS
Ralph Agee	RMSC/SWCC
Sue Clippenger	Mayor's office
Dick Tilles	TAMS
Tony Casendino	CBT
Andrew Jenkins	CBT-Roxbury
Peter Smith	CBT
Paul Porell	BRA

1. Dick Tilles said that we should meet with Bob Sloane at CTPS with respect to the BTPR Mobility Study, the Circumferential Transit Study, and the proposed rail link in the Central Artery reconstruction project. Clark Frazier said that we also should meet with the Core Area sub-committee of JRTC. Tony Casendino said that Kathy Stein - Hudson said that the Committee was not active.
2. The proposed ridership survey forms were discussed. The major comments were that, if possible, they should be color-coded for differentiation from the North Shore survey and that they should also be in Spanish. Clark Frazier said that a question to obtain information on the respondent's final station should be added.
3. The study question and answer forms handed out at the previous Friday session were discussed. It was suggested to add information on the Midland Branch work. Tony Casendino said that the forms should be distributed to all T employees. Peter Calcaterra said that he would be able to do this, at least for employees living in the study area.
4. Study processes were then discussed. Clark Frazier said that the best process would be a letter from Secretary Salvucci explaining how community concerns would provide input to the study. Ralph Agee said that process discussions must continue until the community is convinced that they will have a major say in the Study. Sue Clippenger said that the Project Working Committee wasn't working. Clark Frazier said that CBT should run meetings since they would be better able to get meetings away from process discussions and into transit alternatives discussions. Cecil Hansel said that all process material should be presented in graphic form rather than text.
5. Clark Frazier said that neighborhood meetings should be held and that the South End needed more. Tony Casendino explained that we were participating in more meetings south of Dudley because these areas had not yet been organized. It was agreed to hold a meeting in the South End prior to the June 28 PWC meeting.

6. Tony Casendino said he would check out the Charles Drew Family Life Center for the June 28 meeting.
7. It was decided to review the study schedule for the next few weeks at next Friday's meeting.
8. Sue Clippenger said that an analysis of rebuilt PCC operating costs is available from Ernie Washington in Ron Tober's office.

JUNE 3, 1977

Attendees:

Andrew Jenkins	CBT/Roxbury	Peter Smith	CBT
Dick Tilles	TAMS	Rod Parker	CBT
Ken Kruckemeyer	MBTA SW	Bob Lepore	TAMS
Michael Hawkins	SWCC	Clark Frazier	South End
Gloria Fox	Roxbury APAC	Sam Fuchs	CTPS
Sue Clippinger	Mayor's office	Paul Porell	BRA

1. Population forecasts were discussed. Sam Fuchs said that CTPS was planning to use the State Census for 1975 base data and had assigned values to CTPS zones. CTPS will present these data at next Friday's meeting. After that we will have a meeting on forecasts. Mike Hawkins mentioned the postal surveys as a source of population trends, and Andy Jenkins mentioned the ABCD Planning and Development Office as another potential source.

2. Sam Fuchs said that the MBTA will be running their screenline counts during the week of June 11.

3. Ken Kruckemeyer asked that CTPS prepare a written description of their modelling techniques in time for the June 28 PWC meeting.

4. Distribution of technical materials was discussed. Michael Hawkins said, and it was generally agreed, that 5-10 copies of technical materials should be available at PWC meetings along with provision to mail copies if demand is greater than supply. A list of all available memos should be made up. This list will be sent out at next mailing.

5. Dick Tilles said that right-of-way analysis performed to date was basically an inventory of relevant data on potential R.O.W.'s and that we need to define alternatives before analyzing all alternatives on each R.O.W. There was some disagreement, but this concept appeared to be accepted in principle. TAMS will present R.O.W. inventory material at next Friday's meeting.

6. Service analysis was discussed. Clark Frazier said that we need to compare bus operating speeds which Bob Lepore said that he was doing. Speeds will be compared to other cities and to other parts of the T system. An analysis of how to improve the system will be made. Ken Kruckemeyer suggested that Bob talk to Dick Barber at the T about this.

7. It was decided that next Friday's meeting would be devoted primarily to land use and that BRA district planners would attend.

8. Peter Smith said that the Charles Drew Family Life Center on Blue Hill Avenue was confirmed for the June 28 PWC meeting.

9. Peter Smith handed out revised questions and answers. Dick Tilles asked for comments on them and said that they will be finalized this week. Ken Kruckemeyer will contribute material on the Crosstown Street and the Midland Branch.

JUNE 10, 1977

Attendees:

Andrew Jenkins	CBT/Roxbury	Michael Hawkins	SWCC
Dick Tilles	TAMS	Peter Smith	CBT
Ken Kruckemeyer	MBTA SW	Tony Casendino	CBT
Peter Calcaterra	MBTA SW	Yong Chang	CTPS
Paul Porell	BRA	Clark Frazier	South End
Rod Parker	CBT	Jim Baecker	BRA

1. Yong Chang presented a map showing 1975 population estimated by CTPS zone based on (a) an update of 1970 U. S. Census data and (b) 1975 State Census data. He said that differences between these two sources were significant only in the South End and Roxbury parts of the study area. The State Census showed more people in the South End and fewer people in Roxbury than updated Federal Census data.

2. South End residents thought that the State Census data were fairly accurate for the South End, except for Castle Square, where population appeared to be undercounted. A quick look at Roxbury showed some obvious discrepancies in both sets of numbers. It was decided to schedule a meeting where people knowledgeable about both communities could interact with CTPS to finalize 1975 zone population estimates.

3. Population forecasting was then discussed. Yong Chang handed out a sheet showing CTPS projections through the year 2000. The sheet contained two forecasts; an original CTPS estimate which did not differentiate between neighborhoods and a more recent forecast which does differentiate.

4. Paul Porell said that BRA studies showed that Boston's population decline had bottomed out and was increasing slightly. CTPS assumes that it will continue to decline slightly over the next 25 years. Yong Chang said that Joe Brevard of CTPS would discuss forecasting procedures at a future coordination meeting.

5. There was some concern about the large population declines forecast for Roxbury and North Dorchester. Dick Tilles said that we should go with the original CTPS forecasts for these areas, at least in Phase I, since these differences should not impact the relative levels of ridership enough to rule out alternatives that look promising from other standpoints. Refinements in population forecasts could then be worked on during the remainder of Phase I so that they would be ready for Phase II. There appeared to be a general consensus in favor of this approach.

6. Peter Smith presented for review revisions to Questions and Answers, a proposed brochure for mail-out and an "information center" to be placed at local agencies, libraries, etc. It was suggested that these could also be displayed at transit stations and supermarkets.

JUNE 20, 1977

Attendees:

Richard Tilles	TAMS
Leora Jaeger	MBTA
Leon Jacklin	BRA
Elbert Bishop	SWCC
Peter C. Calcaterra	MBTA
Yong B. Chang	CTPS
Robert A. Lepore	TAMS
Tony Casendino	CBT
Ralph Agee	R.M.S.C.
Pat Cooke	CBT

1. Bob Lepore described the contents of a draft memo on preliminary service analysis which was distributed at the meeting.

2. Bus operating speeds were discussed. There was a disagreement expressed as to whether the MBTA's computer printout indicated actual or scheduled speeds. Dick Tilles said that he was certain that scheduled speeds were tabulated, but that he would confirm this before the next meeting.

3. Elbert Bishop said that the section on taxis should contain recognition of the fact that many persons have been refused rides into the study area.

4. MBTA fare structure and policy was discussed. Tony Casendino asked whether it was possible to trace ridership decline on lines which previously had free transfers (note: TAMS will try to get that data). Elbert Bishop suggested checking with Dave Gunn or Carla Johnson regarding MBTA policy on commuter rail fares.

5. Elbert Bishop suggested that the impact of transfers on commercial centers be investigated and cited a report by GRDC on the impact of eliminating transfers at Dudley Station.

6. Bob Lepore said that the MBTA does not now collect much of the data required to evaluate its bus routes against its service policy. Peter Calcaterra suggested that we document the need for new data collection methods where required.

7. Elbert Bishop said that a high level person who could modify the MBTA service policy should be at the June 28 meeting. He also suggested that the MBTA capital investment policy as well as service policy be included in the report.

8. Ralph Agee said that most people don't even know that the MBTA has these guidelines. He requested a copy, and Peter Calcaterra said he would get one for him:

9. Dick Tilles went over suggested graphics for the June 28 meeting. Bob Lepore and Pete Smith will work these out on Wednesday at the site office.

10. Elbert Bishop went over suggested changes in minutes of the last PWC meeting, notice of the June 28 PWC meeting and the published questions and answers. His major comments were:

- a. List of publications should give brief summary of contents
- b. Meeting notice should be bilingual
- c. Suggestions handout should have postal paid mailback provisions
- d. Addresses given for the minutes should be actual office or home addresses
- e. The project site office should be listed separately in the questions and answers rather than including it in the study area description

JUNE 24. 1977

Attendees:

Peter Calcaterra	MBTA SW	Clark Frazier	South End
Ken Kruckemeyer	MBTA SW	Peter Smith	CBT
Carlos Diaz	MBTA Community Affairs	Yong Chang	CTPS
Ralph Agee	RMSC	Rocco Mancini	MBTA
Dick Tilles	TAMS	Pat Cooke	CBT
Bob Lepore	TAMS	Tony Casendino	CBT
		Paul Porell	BRA

1. Dick Tilles handed out a draft memorandum entitled "Comments on Generalized Alternatives and Development of Alternatives for More Detailed Analysis". He explained that the major purpose of the handout was to generate discussion and consensus on which alternatives should be submitted to CTPS for ridership analysis.

2. Ken Kruckemeyer asked if entire alternatives had to be defined and whether or not specific links could be tested separately. Yong Chang said that the ridership model could come up with data on only discrete, completely defined alternatives. He explained that CTPS would finalize their model calibration in two weeks and spend an additional 2-3 weeks running the base case alternatives.

3. Clark Frazier suggested that alternatives be about equally divided between Blue Hill Ave. and Midland Branch alignments.

4. It was suggested that all or part of the memo be sent out to key members of the project working committee prior to the next PWC meeting. This meeting was scheduled tentatively for July 26.

5. Bob Lepore discussed items on service analysis he would discuss at the June 28 PWC.

6. Clark Frazier said that the analysis should look at ways to more effectively utilize bus drivers.

7. Peter Calcaterra introduced Carlos Diaz of MBTA Community Affairs. He mentioned that the T was planning during July to conduct a few neighborhood meetings to deal with specific service complaints. Ralph Agee said that this might be too many meetings for the community. Dick Tilles said that SWCC was the organization that suggested having these meetings.

8. Tony Casendino asked that our study team receive community hand-outs generated by the Orange Line design. Peter Calcaterra agreed that this would be done.

JULY 1, 1977

Attendees:

Dick Tilles	TAMS	L. V. Randolph	GRDC
Yong Chang	CTPS	Leon Jacklin	BRA
Rod Parker	CBT	Peter Calcaterra	MBTA
Margaret Elshurst	BCMC	Dan Ocasio	MBTA
Rosalind Horner	Mount Bowdoin Betterment	Peter Smith	CBT
		Bryon Rushing	Museum of Afro American History
Craig Inge	GRDC		
Clark Frazier	SECOT	Pat Cooke	CBT
George Alieu	MBTA	Mike Hawkins	SWCC

1. Peter Calcaterra suggested that Friday coordination meetings be held every two weeks during July. We would then see how this works out to see if it should be extended into August. He asked Pete Smith to have regular attendees notified of the change.

2. Dick Tilles then asked for comments on the specific transit alternatives proposed for ridership estimation by CTPS. These alternatives were described in a memorandum handed out at last Friday's meeting.

3. Clark Frazier said that Grove Hall should become a major transfer point for buses. Crosstown bus service would run then in the Ruggles/Dudley/Uphams Corner corridor and an Ashmont/Grove Hall/Jackson Square Corridor. He suggested a time-transfer (or "pulse") alternative for testing by CTPS. He said that feeder buses should feed stations as far away from downtown as possible to maximize passenger miles on rapid transit and minimize bus congestion close to downtown.

4. Dick Tilles said that CTPS Phase I output will provide only total line boardings. Yong Chang said that the model in Phase I could estimate riders on segments of a transit line but would not be accurate on a station by station basis. He said that the alternatives proposed were good because they were sufficiently different in terms of mode and alignment to provide a good test of model sensitivity. He said that Washington Street should be used in the rapid transit alternative.

5. Pat Cooke raised a question on how important the model was in selecting alternatives. It was explained that ridership was only one of many criteria for selection.

6. Rosalind Horner said that delineating new transit terminal might be a problem in that residential areas might get undersirable traffic and commercial development. Dick Tilles said this could be a problem so that generally terminal points would be put in existing commercial areas.

7. Both Laverne Randolph and Peter Calcaterra emphasized the importance of retaining Dudley Station as a major node after Orange Line Relocation.

8. Craig Inge said he had been talking to local businessmen who depended on local bus routes for much of their service and would not like to see major revisions to these routes.

9. Clark Frazier said that alternatives should look at grid, tree and time-transfer systems for alternatives. Yong Chang said it was unrealistic to envision more than one line haul alternative branch.

10. Clark Frazier said it was particularly important to run a time-transfer system at night.

11. The remainder of the meeting concentrated on redefining some alternatives. In particular Clark Frazier suggested that an electrified-frequent service commuter rail alternative be tested. He also requested that light rail in Alternative 5, be extended to Grove Hall. A Washington Street/Seaver Street light rail line was also proposed.

JULY 15, 1977

Attendees:

Dick Tilles	TAMS	George Alieu	MBTA
Mike Hawkins	SWCC	Paul Porell	BRA
Robert Lepore	TAMS	Peter Calcaterra	MBTA
McCallister Canada	Museum of Afro-	Cecil Brown	SWCC
	American History	Rod Parker	CBT
Kitty Langford	Museum of Afro-	Curtis Davis	GRDC
	American History	Carlos Diaz	MBTA
Craig Inge	GRDC	Pat Cooke	CBT
Tony Casendino	CBT	Peter Smith	CBT
Clark Frazier	SECOT		
Dan Ocasio	MBTA		
Ken Kruckemeyer	MBTA		

1. Dick Tilles stated that the purpose of this coordination meeting was to discuss the agenda for the July 26, 1977 project working committee meeting. This will primarily include a review of initial transit improvement alternatives that have been developed for testing by the study team. He informed the group that the present schedule calls for the CTPS generating ridership demand at a rate of one alternative per week beginning August 1 which will continue to October. The final phase 1 Feasibility Report recommending four to five alternatives for Phase 2 will be completed by November, 1977.

2. Peter Calcaterra requested that Mike Hawkins be available to help disseminate the evaluation results for each alternative to the community as they become available from the CTPS and study team.

3. Clark Frazier said that he was unsure that the community will be able to adequately respond through this process in terms of recommending viable new alternatives. In addition, he was concerned that time limitations might preclude the testing of all possible alternative links and route segments.

4. Tony Casendino said it was important for the community to review an initial set of draft recommendations in order to discern potential alternatives which had not been addressed and warranting evaluation.

5. Mike Hawkins said that he did not like the emphasis given to the Midlands Branch as an alternative alignment segment within the preliminary development of alternatives report prepared by Dick Tilles. He said he would like to see a balance between Blue Hill Avenue and the Midlands Branch as potential alignment segments. In addition, a distinction between replacement or improvement service should be made for each alternative developed.

6. Dick Tilles said that the differentiation of Blue Hill Avenue and the Midlands Branch was not as great as was believed by Mike. Service to Dudley and Grove Hall is basically replacement service with improvement service south of Grove Hall using either the Midlands Branch or Blue Hill Avenue.

7. Ken Kruckemeyer said that the problem is one of adequately comparing one alignment segment with another, and then, synthesizing those segments with merit into coherent and feasible alternatives.

8. Clark Frazier said that the public will always question how a particular list of alternatives was developed and why alternatives were dropped.

9. Ken Kruckemeyer said that the preliminary list of alternatives developed by Dick should be thought of as a tool to discern potential alignment corridors by acquiring information needed to make decisions concerning alignment and technologies.

10. Dick Tilles laid out a series of maps displaying alternatives suggested for initial testing by the CTPS and study team. He suggested that these alternatives should be listed (prioritized) in the order in which they should be tested.

11. Clark Frazier recommended that, in addition to evaluating individual alternatives, combinations of alternatives should be evaluated during phase 1, i.e., a radial alignment tested simultaneously with a cross-town alignment. As an example, he suggested a cross-town link with the Red Line tested along with one of the radial alternatives displayed on the maps.

12. After considerable discussion, a list of seven alternatives were recommended by the group to be presented at the July 26 working committee meeting as initial alternatives to be tested. The seven alternatives include:

1. Washington-Seaver-Blue Hill alignment, LRV technology
2. Washington-Warren-Blue Hill alignment, LRV technology
3. Washington-Dudley-Midland Branch alignment, LRV technology
4. Ruggles-Dudley-Columbia Point cross-town alignment with LRV technology in combination with Washington-Warren-Blue Hill alternative (#2) above
5. Washington-Dudley-Midland Branch alignment, rapid transit technology
6. Washington-Warren-Blue Hill alignment, bus (exclusive busway) technology
7. Midland Branch commuter rail in combination with Washington-Warren alignment to Grove Hall with LRV technology

13. Carlos Diaz said that based on meetings held between MBTA Community Affairs and Operations, Bus Route 15 - Kane Square to Dudley, Route 29 - Egleston to Mattapan, and Route 44 - Dudley to Seaver Street will be surveyed during the first two weeks in August. Part-time personnel will be hired to evaluate the services for all daily operating periods.

JULY 29, 1977

Attendees:

Kitty Langford	Museum of Afro-American History	Craig Inge	GRDC
McCallister Canada	Museum of Afro-American History	Paul Porell	BRA
Yong Chang	CTPS	Ken Kruckemeyer	MBTA
Don Kidston	MBTA	Ralph Agee	RMSC
Tony Casendino	CBT	LaVergne Randolph	GRDC
Clark Frazier	SECOT	George Alieu	MBTA
Peter Calcaterra	MBTA	Peter Smith	CBT
Michael Hawkins	SWCC	Pat Cooke	CBT
		Cecil Brown	SWCC

1. Dick Tilles presented a detailed description of transit alternative 2 (Washington-Warren-Blue Hill LRV) which included station location, average vehicle speed, travel time and a feeder bus network.

2. Don Kidston asked which cross-streets were closed as part of the installation of a surface median. Dick Tilles said that the number of cross-streets was taken from previous BTPR analyses. (Note: cross-streets are shown on pages III-66 and 67 of the BTPR Southwest Report.)

3. Dick Tilles explained that the system assumed an average dwell time of 20 seconds at stations. Mike Hawkins wanted to know if this was realistic at major stations such as Dudley. Ken Kruckemeyer said it might be reasonable to use turnstiles at major stations like Dudley to cut down on dwell time.

4. A lengthy discussion about fares took place. Dick Tilles proposed that a straight \$.25 fare be assumed to make it competitive with Orange and Red Lines. Don Kidston said that this was against current MBTA fare policy which charged \$.50 fare for surface trolleys. Don explained that a trolley was assumed to combine both feeder service with downtown distribution like a bus-subway combination, and, therefore, it was reasonable to charge the equivalent of two fares. Yong Chang said that the model took fares into account for modal split determination only and that total travel time was the only consideration in assignment to the transit line. Both Ralph Agee and Mike Hawkins felt that fare structure was important in terms of development and public acceptance. Clark Frazier said that public input was required for the MBTA's new Fare Policy Committee.

5. Clark Frazier said that more citizen input was required in the feeder bus network to the relocated Orange Line. It was suggested that this was more properly part of the Orange Line Relocation Study.

6. LaVergne Randolph said that the bus system should consider needs of elderly-handicapped, etc. even if service was not specifically required to feed transit stations. Paul Porell suggested that gaps in the feeder bus system should be noted against MBTA spacing standards.

3

7. Peter Calcaterra said that a coordination meeting should be held next Friday to go over additional alternatives and that perhaps meetings should be held weekly during August.

8. Peter Calcaterra suggested that community input on evaluation criteria be solicited. Tony Casendino will get a letter out soliciting such input.

9. Tony Casendino said that the next project working committee meeting (Sept. 14) would be held at the Shelburne Center (Washington St. and M. L. King Blvd.).

AUGUST 5, 1977

Attendees:

Peter H. Smith	CBT	Peter Calcaterra	MBTA
Pat Cooke	CBT	Robert Lepore	TAMS
Rod Parker	CBT	George Alieu	MBTA
Michael Hawkins	SWCC	Craig M. Inge	GRDC
McCallister Canada	Museum of Afro-American History	Paul Porell	BRA
Leon Hines	Museum of Afro-American History	Yong Chang	CTPS
		Sue Clippinger	Mayor's Office
Clark Frazier	SECOT		

1. Peter Calcaterra stated that the purpose of this coordination meeting was to receive and review a status report by the CTPS concerning development of ridership demand projections for two base case transit networks and a set of potential replacement/improvement transit alternatives. In addition, TAMS staff would present several additional transit networks that had been developed for subsequent incorporation with CTPS work concerning ridership demand projections.

2. Clark Frazier stated that the extended discussion of "signal preemption" assumptions for at-grade LRV alternatives was not referred to in the minutes of the July 29, 1977 Coordination Meeting. Mr. Frazier retorted that it was his belief that the group attending that meeting had agreed to 100% "preemption" at minor intersections and partial "preemption" at major intersections.

3. Mike Hawkins asked that the concept of signal preemption be explained, where it is presently used, and how well it works.

4. Bob Lepore stated that one type of preemptive system would include equipment on-board the transit vehicle (LRV or bus) which would control traffic signals at intersections to reduce travel delays at such points. He further stated that preemptive systems are commonly used by European light rail systems and that they do provide for increased operating speeds.

5. Paul Porell stated that advanced planning was proceeding for a "preemptive" system for the Commonwealth Avenue segment of the MBTA Green Line.

6. Mike Hawkins responded that "preemptive" technology assumptions for LRV alternatives are not necessarily wrong; however, law enforcement of existing traffic codes is exceedingly important and must be eventually addressed. He stated that spending millions of dollars on preemptive technology to circumvent municipal responsibilities of traffic enforcement is counter-productive.

7. Clark Frazier stated that he is also concerned with technological overkill (accompanied by high costs) in specifying alternatives. Mr. Frazier cited a simplified and relatively inexpensive preemptive system including a trip relay located a short distance from the signalized intersection which would automatically activate the traffic signals by the passage of the transit vehicle. Mr. Frazier stated that he would like this issue of preemptive systems clarified by the conclusion of Phase 1.

8. Yong Chang stated that ridership demand projections for both Base Cases had been completed by CTPS. For Base Case 1 (existing Orange Line structure south of Essex Station) a twenty-four hour inbound boarding projection of 36,000 was estimated for the 1985 projection year. For Base Case 2 (relocated Orange Line south of Massachusetts Avenue Station) a twenty-four hour inbound boarding projection of 41,000 was estimated for the 1985 projection year. He further stated that the 1985 year of projection primarily assumes population and employment stability from the 1975 data base used by the CTPS. Mr. Chang believed that only inbound boardings should be used for subsequent analysis.

9. Clark Frazier stated that he would like to see the CTPS develop several bar charts displaying the relative proportion of inbound to outbound boardings to verify Mr. Chang's contention that only inbound boardings should be used.

10. Yong Chang responded that this was feasible and would be done at the earliest opportunity. He further stated that at the next Coordination Meeting (August 5) ridership demand projections for Alternative 2: Washington-Warren-Blue Hill Avenue, LRV would be presented.

11. Clark Frazier wanted to know why CTPS did not include Massachusetts Avenue, Back Bay, and South Cove Stations as part of the Base Case 2 ridership demand projections, as these stations are clearly within walking distance of many residents of the study area.

12. Yong Chang explained that the present computer model used by CTPS to project ridership demand has aggregated the original 590 zones used by a prior CTPS ridership demand model to 170 larger zones. This procedure has increased the difficulty in discerning ridership patterns due to the increased size of zones used by the present model. The present model does not provide a clear differentiation of trips emanating from the north and south of these stations.

13. Clark Frazier stated that he would be willing to meet with Mr. Chang to discuss in detail the computer techniques utilized by CTPS to project ridership demand and to report his findings.

14. Peter Calcaterra concurred with Mr. Frazier's suggestion to provide the group with additional information concerning the CTPS model.

15. After considerable discussion, the group attending this Coordination Meeting agreed that demand projections for Massachusetts Avenue, Back Bay and South Cove Stations must be included for Base Case 2 and alternative rider-ship demand projections. It was acknowledged that demand projections for these stations would be somewhat "muddy"; however, their usefulness would be particularly evident during the subsequent evaluation of developed alternatives.

16. Robert Lepore presented several alternative transit networks that had been recently developed by TAMS staff. The alternative networks displayed and reviewed included:

- Alt. 1: Washington-Seaver-Blue Hill, LRV
- Alt. 2: Washington-Warren-Blue Hill, LRV
- Alt. 3: Washington-Dudley-Midland, LRV
- Alt. 8: Washington-Warren-Blue Hill, Rapid Transit

The networks displayed included preliminary information concerning alternative alignment, station locations, alignment construction assumptions, train lengths, average operating speeds, headways (frequency of service) and a feeder bus system serving the alternative alignment (including route layout, headways, and operating speeds).

After considerable discussion by the attending group, several modifications of the alternative networks, as displayed, were recommended. These modifications included:

- Clearer definition of transit terms used in defining the alternative networks (such as vertical profile, signal preemption, peak factors, etc.)
- Station names should be consistent with existing stations where applicable, i.e.,
 - Berkeley Street to Dover
 - Massachusetts Avenue to Northampton
 - Columbus to Egleston
- Bus Route 68 - Copley to E. Concord to be simplified and combined with Route 13 - Savin Hill to Massachusetts Avenue to provide one extended cross-town route between Savin Hill and Copley Square
- Bus Route 44 - Dudley to Seaver Street to be included as part of feeder bus network, and, for several alternatives, to be combined with Route 19 - Fields Corner - Jackson Corner to provide extended cross-town service between Dudley and Fields Corner
- Realignment of segments of Route 8 - Columbia Point-Ruggles Station, Route 16 - Andrew-Jackson Station, and Route 22 - Ashmont-Jackson Square
- For Alternative 3: Washington-Dudley-Midland, LRV, the addition of a station site between Dudley and Blue Hill Avenue to be designated "Orchard Park"
- The proposed station at Union Park in South End to be designated "Cathedral"

AUGUST 12, 1977

Attendees:

Dick Tilles	TAMS	Leon Hines	Afro-American
Robert Lepore	TAMS		Museum
Pat Brennan	TAMS	Clark Frazier	SECOT
Paula Waters	Mayor's Office	Tony Casendino	CBT
Sue Clippinger	Mayor's Office	Mike Hawkins	SWCC
Peter Calcaterra	MBTA	Rod Parker	CBT
Rocco Mancini	MBTA	LaVergne Randolph	GRDC
Ken Kruckemeyer	MBTA		

1. Peter Calcaterra stated that the purpose of this coordination meeting was to review ridership demand projections for Alternative 2 (Washington-Warren-Blue Hill, LRV) developed by CTPS, to present the transit network for Alternative 5 (Washington-Dudley-Midland, Rapid Transit) developed by TAMS staff, and to decide the order for developing the remaining alternative networks.

2. Dick Tilles asked to what extent potential property takings should be shown in delineating alternatives. Clark Frazier said that property takings should go hand-in-hand with redevelopment of the street properties along the street. Ken Kruckemeyer said that property takings and redevelopment should be outlined in general terms only.

3. Bob Lepore stated that recent delays encountered by CTPS would probably preclude any review of Alternative 2 ridership demand projections. He stated that the projections would become available later in the day.

4. Clark Frazier asked if comments expressed at the August 5, 1977 Coordination Meeting concerning the alternative networks developed by TAMS staff had been addressed.

5. Bob Lepore stated that the alternative networks now reflect the comments expressed at that meeting, as outlined in the minutes for that meeting.

6. Bob Lepore presented a map showing alternative 5 in more detail. Rocco Mancini thought that the rapid transit might better feed into the re-located Orange Line at Ruggles rather than South Cove to provide a linkage with Back Bay and Northeastern. Mike Hawkins said that this would not fulfill requirements for replacement service. Ken Kruckemeyer suggested that light rail to Dudley be included in conjunction with this change to satisfy replacement service criteria. This change was generally approved, and Sue Clippinger suggested that testing the new alternative 5 be deferred until after the September 14 PWC meeting to get PWC approval of the changes.

7. Dick Tilles asked for comments on the remaining alternatives 4, 6 and 7. It was decided to extend the light rail line in alternative 7 from Washington Street to the Midland Branch where it would intersect with a commuter rail station. The commuter rail line was to turn around at Readville and have stops about every mile.

8. Alternative 4 was to provide for transfer at Dudley between radial and crosstown lines but not have alternating service as suggested by Clark Frazier.

9. Alternative 6 (busway) was discussed in some detail. Peter Calcaterra discussed the importance of the ARZ in determining the busway solution. It was decided that the MBTA would get the ARZ report to TAMS as soon as possible, and then Rocco Mancini, Dick Tilles and Bob Lepore would get together to discuss realistic bus operating speeds in downtown.

10. Rocco Mancini said that there might be a busway capacity problem if too many buses are routed downtown. Dick Tilles said he recognized this and said that many buses would be routed to the relocated Orange Line instead of going downtown. Rocco Mancini also continued about eliminating existing bus stops.

11. Because of all the work required to develop alternative 6, it was decided that Bob Lepore would develop alternatives 4 and 7 for next Friday's meeting and alternative 6 the following week.

AUGUST 19, 1977

Attendees:

Robert Lepore	TAMS	Mike Hawkins	SWCC
Barry Porter	TAMS	Cecil Brown	SWCC
Sue Clippinger	Mayor's Office	Tony Casendino	CBT
Peter Calcaterra	MBTA	Pat Cooke	CBT
Ken Kruckemeyer	MBTA	LaVergne Randolph	GRDC
Clark Frazier	SECOT	Yong Chang	CTPS
Rocco Mancini	MBTA		

1. Peter Calcaterra stated that the purpose of this coordination meeting was to review ridership demand projections for Alternative 1 (Washington-Seaver-Blue Hill, LRV) and Alternative 2 (Washington-Warren-Blue Hill, LRV) developed by CTPS, to present the transit network for Alternative 4 (Ruggles-Dudley-Columbia Point, LRV; Washington-Warren-Blue Hill, LRV) and Alternative 7 (Midland Commuter Rail; Washington-Warren (to Mt. Bowdoin), LRV), and to determine the method of evaluating alternatives in Phase I.

2. Yong Chang presented 1985 transit ridership estimates developed by CTPS for Alternatives 1 & 2. Rocco Mancini stated that he could not find any figures pertaining to bus ridership in the estimates. Yong Chang said that the column titled "Grand Total" includes both bus ridership and riders diverted from automobile and other forms of transportation. Sue Clippinger asked if CTPS could add a column showing new transit riders. Yong Chang said that the model could not show just the bus users and/or new riders. He said that he could add a column showing riders diverted from auto use, and that bus users will be represented in the grand total. Ken Kruckemeyer asked that this column be added to the projected ridership totals for each alternative.

3. Clark Frazier stated that the model used by CTPS had many deficiencies in the assumptions used. Peter Calcaterra asked Clark to discuss the issue with Yong Chang.

4. Bob Lepore presented a map and handouts discussing Alternative 4. Clark Frazier said that the tunnel portion between Huntington Ave. and Ruggles Station could be at-grade. He also suggested that a bus service from Ruggles to Cambridge be added so as to show continuous circumferential service. Bob Lepore said that he could reduce the headways for Route 10/47 so as to coincide with the headways on the LRV. Clark Frazier asked if zero waiting time would be the result. Yong Chang said that a zero waiting time could not be used for any particular bus route. Sue Clippinger asked if the crosstown line could be shown extending beyond Columbia Station to Columbia Point. Bob Lepore said that he did not want to include ridership data from outside the study area in the alternative. However, if the consensus was to extend the line, he would.

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5. Rocco Mancini stated that the operating speeds were very high. He asked Bob Lepore how these speeds were reached. Bob stated that his source was "Light Rail Transit: State of the Art Review," DeLeuw, Cather and Company, as well as the Bruce Campbell report on the MBTA Beacon St. line. Rocco Mancini said that even with signal preemption, there were too many stops for an LRV to operate at the speeds shown. Mike Hawkins stated that we must include present MBTA operating characteristics in developing the alternatives and not assume otherwise. Bob Lepore said that he would look at the assumed average operating speed for the Huntington-Ruggles segment.

6. Bob Lepore presented a handout and map describing Alternative 7 in more detail. Rocco Mancini asked Bob why he didn't use the same assumptions for operating speeds on commuter rail as he had for the LRV. Sue Clippinger wanted to know if electric vehicles were considered. It was agreed that Bob would contact the commuter rail section of the MBTA for more data on the technology and the MBTA's future plans. Mike Hawkins wanted to know what the fare structure would be. Yong Chang said that it was assumed to be the same as an LRV. This was because the CTPS model is not programmed for zone-zone fare changes, therefore comparable distances were assigned comparable costs. Mike Hawkins said that fare structures must be looked at realistically in order for the alternative to be evaluated. Peter Calcaterra said that since fare will not affect the ridership projections, CTPS might consider manually adjusting the projections in order to show differences in fares. The headways on the Midlands will remain at 15 minutes not 5 minutes as Clark Frazier suggested. Ken Kruckemeyer stated that the station in Hyde Park should be Fairmount rather than Cleary Sq.

7. Tony Casendino stated that he had received a questionnaire back from the community which commented on how the replacement service would be paid for. Sue Clippinger said that it would come from the MBTA operating budget and not be paid for Boston residents only. Tony said that some people were afraid that the suburbs would attempt to make a deal so as to avoid paying for a Roxbury transit line.

8. Tony Casendino presented a handout with various additional criteria to be considered in evaluating the alternatives. Sue Clippinger asked if effects on existing bus networks will be considered. Clark Frazier stated that all transit riders will be affected by the alternatives.

9. Clark Frazier asked if phasing of construction will be added to the list. Tony Casendino said that he was open to suggestions.

10. Rocco Mancini said that there were already too many criteria for consideration in Phase I. Tony Casendino said that there are two major suggestions that have been made concerning the list. The first is to reduce it to just Phase I, the other is to include all criteria to be considered in Phases I and II. Presently the list includes all criteria.

11. Pat Cooke announced that the bus survey has been completed, and the results will be presented in two weeks.

12. Bob Lepore will present Alternative 6 at the next meeting. The further development of criteria will also be discussed at that meeting.

13. Mike Hawkins suggested that parliamentary procedure be considered for use at future coordination meetings.

AUGUST 26, 1977

Attendees:

Dick Tilles	TAMS	Peter Smith	CBT
Barry Porter	TAMS	Pat Cooke	CBT
Peter Calcaterra	MBTA	Cecil Brown	SWCC
Rocco Mancini	MBTA	Michael Hawkins	SWCC
Alice Gray	BRA	Craig M. Inge	GRDC
Paul Porell	BRA	Clark Frazier	SECOT
Yong Chang	CTPS		

1. Peter Calcaterra opened the meeting by asking Peter Smith to explain CBT's plans for the developing of criteria to be used at the next Project Working Committee Meeting. Peter Smith said that the members would be presented with a list of qualitative criteria. They would be asked to listen to the alternatives being presented and then comment on how they met the criteria after all alternatives are presented. Dick Tilles agreed that most people attending the PWC meetings are more concerned with the alternatives presented than with what criteria should be used. Peter Smith handed out a list of qualitative criteria which CBT has developed. Peter Calcaterra suggested that these be discussed when Mike Hawkins is present.

2. Pat Cooke stated that Dick Tilles should decide upon the format for the September PWC meeting as quickly as possible. Dick Tilles agreed to present a draft of the proposed agenda at the next coordination meeting.

3. Yong Chang presented CTPS' latest ridership estimates for Alternatives 1, 2, 3 and Base Cases 1 and 2. He noted that columns have been added to show the number of transit riders diverted from bus and auto. Mike Hawkins suggested that a negative be placed in front of the diversions in order to better explain the data. He said that as it currently appears, some people might confuse the total diverted from bus to be the number of bus users. Dick Tilles stated that the model would not show total revenue generated as the only diverted bus riders included are those who rode buses exclusively.

4. Mike Hawkins asked if a column showing new riders could be added. Many people would now ride transit for shopping trips into new developments if conditions were improved. Yong Chang said that the 1975 trip table used in developing the model considered shopping trips into surrounding and local areas. Peter Calcaterra asked Mike Hawkins if SWCC would share the population data used in their development report with CTPS for future use. Dick Tilles stated that the committee must consider future development such as Columbia Point and Blue Hill Ave. in evaluating alternatives. Mike Hawkins asked if CTPS could develop projections on a ten-year basis between 1985 and 2005. It was decided to continue using 1985 and 2000 projections however, during Phase I.

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5. Mike Hawkins asked Yong Chang to bring a copy of the Programming Document used by CTPS in developing the Program. Yong stated that the document costs \$10 and is available for inspection at CTPS. Rocco Mancini stated that the document would be too technical for most people to understand. Mike Hawkins asked Peter Calcaterra to decide upon purchasing it. Peter Calcaterra asked Yong Chang to bring an annotated printout of an alternative to the next coordination meeting.

6. Dick Tilles asked Yong Chang if he could explain Table 2 of the CTPS handout. Yong Chang explained that the divided Alternatives 1, 2 and 3 into three sections each, Northern (South Cove-Dudley, excluding Dudley), Middle and Southern. Dudley was included in the middle segment so as to stabilize the northern segment. Mike Hawkins asked Yong to revise the column labeled "Remarks" so as to minimize confusion. The column presently explains what route the alternative takes in the Middle section. Peter Calcaterra asked Yong to show the ridership with Dudley Station in the Northern Section at the next meeting. Rocco Mancini said that Table 2 actually does not explain as much as Table 1 and may be deceiving.

7. Dick Tilles presented a map and handouts explaining Alternative 6: Washington-Warren-Blue Hill, Busway. Dick said that due to the complexity of the alternative those present may wish individual copies of the alternative in order to review it. Peter Smith asked if there were any right-of-way problems with the proposal. Dick Tilles said that one-way loops have been considered in the area of Grove Hall. He noted that this has been a problem area in alternatives 2, 4 and 7 where tunnels were used. Rocco Mancini stated that the headways for the buses using the Busway were too high. He said that the present headways placed constraints on the system's capacity. Yong Chang said that lower headways for the feeder bus service would provide more advantages for the user of Alternative 6 when compared to the alternatives. Clark Frazier said that if we now find that the feeder service for this alternative cannot meet the demand we can apply the findings to other alternatives. Dick Tilles said that most bus routes were assigned the same headways as in other alternatives, that most feeders to the relocated Orange Line will use the busway temporarily, others will be assigned to the busway as will special sections of feeders. The highest headway along the busway will be between Morton St. and Mattapan. Dick said that some routes would have the headways lowered to 5-10 minutes for testing the model.

8. Peter Smith repeated his explanation of the development of criteria. He would like to form a committee to discuss the qualitative criteria to be used and will meet with Mike Hawkins and Ralph Labeaux.

SEPTEMBER 2, 1977

Attendees:

Peter Smith	CBT	McCallister Canada	Museum of Afro-
Al Sopyla	CTPS		American Histo
Bob Lepore	TAMS	Carlos Diaz	MBTA
Rocco Mancini	MBTA	Pat Cooke	CBT
Dick Tilles	TAMS	George Alieu	MBTA/Southwes
Alice Grey	BRA		Corridor
Sue Clippinger	Mayor's Office	Craig M. Inge	GRDC
Paul Porell	BRA	Leon Hines	Museum of Afro-
Rod Parker	CBT		American Hist

1. Dick Tilles opened the meeting by asking Al Sopyla to report on ridership projections for Alternative 4: Ruggles - Dudley - Columbia Point, LRV; Washington - Warren - Blue Hill, LRV and Alternative 8: Washington - Warren - Blue Hill, Rapid Transit.
2. Rocco Mancini stated that he had a problem with the ridership projection format for Alternative 4 which combined ridership for both radial and cross-town components of the alternative. Mr. Mancini stated that such a format would distort the relative viability of this alternative with respect to the other alternatives which incorporate only radial alignments.
3. Dick Tilles acknowledged this concern and stated that the format for expressing Alternative 4 projected ridership could be altered to display projected ridership for the radial and cross-town components. Mr. Mancini agreed to this alteration. Al Sopyla stated that the second page of his hand-out included ridership projections for each component of Alternative 4.
4. Sue Clippinger asked why projected ridership for the section south of Grove Hall for Alternative 8 differed so little from projections for the light rail alternatives which assumed lower operating speeds.
5. Bob Lepore explained that Alternative 8 assumed fewer station sites for this section as opposed to the light rail alternatives which would tend to extend average trip lengths and times to station sites from surrounding areas.
6. Dick Tilles mentioned that the evaluation methodology for the study would assume alternative evaluation as a function of mode as well as by alignment.

7. Pat Cooke and Carlos Diaz discussed their joint survey of service performance of MBTA Route 29-Egleston to Mattapan, Route 44-Dudley to Seaver Street, and Route 15-Dudley to Kane Square. Mr. Diaz stated that he had not completed his evaluation of the data compiled for Routes 15 and 29. However, his preliminary findings for Route 44 showed considerable problems with schedule adherence during the evening peak period and late evening period, as well as actual trips run as a function of scheduled trips.
8. Rocco Mancini stated that this exemplifies, in part, problems with extended headways, i.e., people will not utilize bus services with long potential wait times.
9. Sue Clippenger stated that these results still show a management performance deficiency.
10. Carlos Diaz stated that establishment of a small group to constantly review the operating performance of every route within the MBTA would provide an excellent low cost management performance tool not now available. Mr. Diaz further stated that he would present his findings at the September 13 Project Working Committee Meeting.
11. Dick Tilles distributed a preliminary list of evaluation criteria to be developed and displayed for each alternative for the September Project Working Committee Meeting.
12. Both Rocco Mancini and Sue Clippenger believed that too many specific criteria were listed for purposes of public display. Both people believed that fewer criteria, displaying the salient features of each alternative, would be more appropriate.

SEPTEMBER 9, 1977

Attendees:

Peter Smith	CBT	Tony Casendino	CBT
Daniel Ocasio	MBTA	Craig Inge	GRDC
Yong Chang	CTPS	Robert Lepore	TAMS
Cecil Brown	SWCC	Dick Tilles	TAMS
Alice Gray	BRA	Rocco Mancini	MBTA
Paula Waters	Mayor's Office	Peter Calcaterra	MBTA
Rosalind Horner	MBTA	McCallister Canada	Museum of Afro-American History
Pat Cooke	CBT		
Ken Kruckemeyer	MBTA	George Alfeu	MBTA

1. Dick Tilles distributed preliminary copies of material to be presented at the September 14 Project Working Committee Meeting. This material was reviewed by those present.

2. Dick explained that data for the bus alternative (6) might only be available on the day before the meeting and would need to be checked out thoroughly before being presented to the public. Peter Calcaterra said that the material should be presented with disclaimers. He also said that alternative 5 should be shown as previously outlined at the July 26 PWC meeting, even though we are recommending a revision to the Plan. The revision would be shown as a dotted line.

3. McAllister Canada asked about the significance of cost data, and just who would be paying for the transit. Dick Tilles explained that the federal government would be asked to pay for 80% of the capital construction cost. The operating cost would be borne by the MBTA, and any deficit would be passed onto the cities and towns, including Boston. Mr. Canada then requested the consultant to explain how ridership for a transit system could be generated when the alternative has not been constructed and operated. Dick Tilles explained that the computer is used as a tool to predict ridership for planning purposes.

4. Rocco Mancini reiterated his demand, made at last week's meeting, that riders on the crosstown link of alternative 4 be shown separate from other riders. It was agreed that alternative 4 ridership projections would be disaggregated for the crosstown and radial alignments of the alternative. This would also be done for alternative 7 ridership projections.

5. Dick Tilles explained that the neighborhood to downtown trip time estimates for each alternative, to be included in the material presented at the September 14 Project Working Committee Meeting, may not necessarily assume usage of the respective alternative should a shortest time path exist elsewhere. Mr. Tilles stated that this procedure would indicate the ability of an alternative to provide improved service (in terms of travel time) to major Study Area locations.

6. McAllister Canada asked what information will be going to the public. Peter Smith said that summaries of the information given out at the September 14 meeting will be distributed to the general public at other meetings.

7. Dan Ocasio suggested that right-of-way requirements be indicated on sheets showing each alternative rather than on the summary sheets.

8. Yong Chang of CTPS showed rider results from alternative 7. These results showed only a limited number of railroad riders on the Midland Branch because of less frequency of service and few connection possibilities at South Station. About 5,000 inbound passengers were using the line, including 1,200 south of Mattapan.

9. Strategies for presentation at the PWC meeting were discussed. It was recommended that the consultant comment on the significance of the results without making final recommendations until the October 18 meeting.

10. Rosalind Horner asked what information would be provided at the September PWC meeting that was not available at the July 26 PWC meeting. Peter Calcaterra stated that we now have more information than merely lines on a map. This new information includes capital and operating costs, ridership, trip times and additional right-of-way analyses.

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SEPTEMBER 16, 1977

Attendees:

Peter Smith	CBT	Leon Hines	-Museum of Afro-American Hist.
Yong Chang	CTPS	Laverne Randolph	GRDC
Cecil Brown	SWCC	Craig Inge	GRDC
Paula Waters	Mayor's Office	Robert Lepore	TAMS
Pat Cooke	CBT	Dick Tilles	TAMS
Paul Porell	BRA	Rocco Mancini	MBTA
		Peter Calcaterra	MBTA

1. Dick Tilles opened the meeting by stating that he wished to review Alternative 5, as amended, and to discuss and develop a list of additional alternatives that warrant evaluation during Phase I.

2. Craig Inge asked why trip time information for each alternative presented at the September 14 Project Working Committee Meeting included walk plus wait time. Dick Tilles explained that the foldout map included station to station time. However, the preliminary evaluation text included zone to zone trip time estimates. Mr. Tilles explained that this was done in order to provide a standardized means of comparing alternatives in terms of improved transit travel times to various Study Area neighborhoods.

3. Dick Tilles presented an amended Alternative 5 (Ruggles Station to Mattapan, Rapid Transit; Washington Street to Dudley, LRV). Rocco Mancini stated that proposed headways of 4 minutes for each rapid transit branch south of Ruggles and 2 minutes north of Ruggles was not reasonable in terms of 4 minute headways assumed for Base Case 2 - Relocated Orange Line only. Dick Tilles responded that these headways are basically consistent with headways generated for Alternative 8 and Base Case 2. Mr. Mancini stated that he was concerned about operating 2 minute headways downtown and that excessive ridership would be projected for this alternative with such headway assumptions. After further discussion, the group agreed that CTPS should test the level of headway sensitivity of the model by running Base Case 2 at greater than 4 minute headways.

4. Dick Tilles began to discuss several new transit alternative concepts for potential development and evaluation during the next four weeks. Alternative 9 would assume similar alignments to Dudley and Mattapan as Alternative 5. However, the alignment to Mattapan would be utilized by LRV technology and connect with the Huntington Avenue Branch of the Green Line. The alignment to Dudley would assume high frequency bus service into the Downtown ARZ. This alternative was suggested for consideration in the MBTA's Program for Mass Transportation (PMT). Clark Frazier responded that this Alternative and Alternative 5 differed only by mode; therefore, it was best suited for the Phase 2 alternatives analysis. Dick Tilles responded that present Phase I work was essentially an alternatives analysis. In addition, Mr. Tilles stated that since such an alternative will have to be evaluated at some point, the community and Study would best be served if this Alternative were evaluated at this point. Mr. Frazier agreed that evaluation of this alternative

was perhaps inevitable, but, he would prefer to delay development of this alternative until ridership projections for Alternative 5 were available and additional operations analysis for alternative 6 (Busway) was completed. Dick Tilles tentatively agreed to this schedule.

5. Dick Tilles proposed an augmented feeder bus alternative to the relocated Orange Line, essentially, an improved Base Case 2. Mr. Tilles further stated that this proposed alternative would be in addition to further operational development and ridership estimations for Alternative 6-Busway. Mr. Tilles informed the group that George Casper, TAMS staff, would make a presentation on signal preemption at the September 23 Coordination Meeting (subsequently postponed).

6. Clark Frazier proposed an alternative assuming extensive LRV crosstown services since all the alternatives which have been analyzed or proposed assume radial alignments, except Alternative 4. Mr. Frazier recommended that the alternative should investigate the feasibility of a Jackson Square to Ashmont or Fields Corner alignment, in addition to the Ruggles to Columbia Point corridor and segments of the Midland Branches as well as Blue Hill Avenue. Dick Tilles stated that his major concern with this alternative involved the limited amount of time remaining in Phase 1 for investigating new alternatives. After considerable discussion, a decision was made that this evaluation be deferred after a preliminary estimation of ridership potential in the corridor for the bus mode using Alternative 6.

7. Peter Calcaterra summarized the list of new alternatives discussed at this meeting and assigned a priority for developing and testing each of these alternatives.

This schedule assumes:

Alternative 5 submitted immediately to CTPS for ridership projections by September 23.

The augmented feeder bus alternative developed by September 23 with CTPS ridership projections by September 30.

Both alternative 6-Busway and Alternative 9-Huntington Ave. to Mattapan, LRV, and Washington Street to Dudley, Bus Service evaluated by October 7 after further traffic analyses for both the Auto Restricted Zone (ARZ) and Washington alignment are completed (September 30). In addition, Alternative 6 will assume high frequency bus service along the Jackson Square to Ashmont corridor to evaluate corridor feasibility.

A decision to be made to test the feasibility of LRV along the Jackson Square to Ashmont corridor in addition to the alignments proposed for Alternative 4 after completion of the above (October 7).

8. Peter Smith presented a list of scheduled neighborhood meetings that will be attended by members of the study team in order to present information and receive comments at a local level on the status of the study.

SEPTEMBER 23, 1977

Attendees:

Peter Calcaterra	MBTA	Yong Chang	CTPS
Rocco Mancini	MBTA	Peter Smith	CBT
Dick Tilles	TAMS	Cecil Brown	SWCC
Robert Lepore	TAMS	Paula Waters	Mayor's Office
Craig Inge	GRDC	Sue Clippinger	Mayor's Office
Paul Porell	BRA	Lavergne Randolph	GRDC
Pat Cooke	CBT	Clark Frazier	South End
Rosalind Horner	Liaison	Ken Kruckemeyer	MBTA
		Polly Russell	SWCC

1. Dick Tilles opened the meeting by stating that he wished to review (1) the sensitivity of the CTPS model to headways, (2) ridership projections for Alternative 5 (Ruggles Station to Mattapan, Rapid Transit; Washington Street to Dudley, LRV, (3) characteristics of Alternative 10 (Augmented Feeder Bus), and (4) additional data to be generated by CTPS for Phase 1 evaluation.

2. Yong Chang stated that based on CTPS model sensitivity analyses, increasing Base Case 2 headways from 4 minutes to 6 minutes results in a corresponding ridership decline of approximately 9 percent. Mr. Chang further stated that CTPS was presently testing model sensitivity at 2 minute headways. Mr. Chang requested that everyone present at the meeting take note that the automobile diversions that have been displayed for Alternative 6 (8,860 Daily Inbound) were incorrectly doubled, and therefore, should be halved. Finally, Mr. Chang briefly described ridership results for Alternative 5.

3. Peter Calcaterra asked if Alternative 4 (includes crosstown segment to Columbia Point) provided direct access to the Red Line Quincy Branch at Columbia Station. Yong Chang replied that it did not and Mr. Calcaterra said that this should be noted in the final report.

4. Sue Clippinger stated that the operational problems associated with Alternative 6 (Busway) should be documented in order to develop procedures that would lead to the elimination of this alternative.

5. Dick Tilles provided a review of Alternative 10 (Augmented Feeder Bus). Mr. Tilles explained that the objective of Alternative 10 is to test the long-range feasibility of an all feeder bus network with improved service frequency to serve the transportation needs of the Area. Mr. Tilles further stated that this alternative should not be interpreted as a recommended system for improving existing transit service deficiencies.

6. Sue Clippinger requested that Route 8 - Columbia Point to Ruggles and Route 47 - Andrew Station to Central Square be combined rather than Route 47 and 10 - Ruggles to City Point for Alternative 10. After further discussion, the following modifications to Alternative 10 were approved:

- Route 8 and Route 47 combined to provide service between Central Square and Columbia Point
- Route 15/41 - Centre & Elliot Streets to Kane Square extended to Fields Corner
- Headways reduced for Route 42/49 - Forest Hills to ARZ, Route 43 - Egleston to ARZ, and Route 13/68 - Savin Hill to Copley

7. Paul Porell and Yong Chang discussed additional data requested by the BRA and it was decided that the following tabulations would be prepared by CTPS:

- a. The trip time matrix would be expanded to include additional destinations outside the Study Area (Central Square, Allston), as well as two additional destinations within the Study Area. The matrix would also include the routing between the origin and destination.
- b. Travel times between all trip origins and destinations would include an estimate of the number of transfers required.
- c. Total transit ridership projections for all alternatives would be disaggregated by neighborhood (approximately five areas).

8. Clark Frazier stated he would like to see per capita ridership versus auto ownership tabulated by neighborhood and compared to both other cities and various areas of the MBTA District.

SEPTEMBER 30, 1977

Attendees:

Pat Cooke	CBT	Bob Lepore	TAMS
George Alieu	MBTA	Georgy Bezkorovainy	TAMS
Paula J. Waters	Mayor's Office	Peter Calcaterra	MBTA
Paul Porell	BRA	Sue Clippinger	Mayor's Office
Dick Tilles	TAMS		
Cecil Brown	SWCC	Yong Chang	CTPS
Craig Inge	GRDC	Peter Smith	CBT
Tony Casendino	CBT	Alfred Howard	BRA
Ken Kruckemeyer	MBTA	Polly Russell	SWCC
Clark Frazier	SECOT	Carlos Diaz	MBTA

1. Dick Tilles opened the meeting by stating that he wished to review (1) ridership projections for Alternative 10 (Augmented Feeder Bus), (2) operations analysis for Alternative 6 (Busway), and (3) location of the next Project Working Committee Meeting. Cecil Brown, SWCC, stated that the Roxbury Caucus of the Southwest Corridor Coalition had met the previous week and agreed upon the elimination of several alternatives. Mr. Brown requested time, later in the meeting, to discuss the results of that meeting.

2. Bob Lepore stated that ridership projections for Alternative 10 would not be available for the meeting. However, the projections would certainly be available at the next Coordination Meeting.

3. Georgy Bezkorovainy presented the following results of his analysis of Alternative 6:

- A typical Washington Street busway would have two moving bus lanes, two traffic lanes and two parking lanes. At major inter-sections, bus pull-offs and left-turn lanes for traffic would also be provided.
- North of Dudley Street, all traffic signals along the busway would be interconnected and set for a progressive speed of 15 mph. This would permit the buses to operate at an average speed of 15 mph, assuming that each bus stops at each designated bus stop. Bus priority at most traffic signals will permit buses to achieve higher speeds if bus stops are bypassed.
- Interconnection of signals along Washington Street will result in lack of coordination of some east-west streets which cross Washington Street.
- Most existing Washington Street signals contain an exclusive pedestrian phase. An exclusive pedestrian phase would not be compatible with the Washington Street busway interconnection signal system.

Clark Frazier stated that a partial phase overlap could be applied that would allow pedestrians to cross the roadway concurrent with the bus priority phase. Mr. Bezkorovainy stated that this was legally unacceptable. Ken Kruckemeyer stated that some form of concurrent pedestrian and automobile phase would probably be workable. Dick Tilles stated that a compromise solution should be worked out eventually.

4. Dick Tilles stated that based on this subsequent analysis of Alternative 6, the following adjustments to the alternative should be made:

- ARZ operating speed of 5 mph
- Increase number of buses between Mattapan and Grove Hall
- Reorient some service from downtown to the relocated Orange Line
- Provide high frequency service between Jackson Square and Ashmont to test for corridor feasibility.

5. Cecil Brown stated that the Roxbury Caucus of the Southwest Corridor Coalition agreed that Alternatives 1, 3, 6 and 7 should be eliminated in Phase 1. Mr. Brown then reviewed a new alternative, developed by the Caucus, which included elements of Alternatives 1, 4 and 8. Briefly, this alternative would include:

- Rapid transit from Essex Station to Mattapan along Blue Hill Avenue (Alternative 8)
- LRV technology crosstown from Ruggles to Columbia Point (Alternative 4 segment)
- LRV technology between Dudley and Franklin Park Zoo via Washington and Seaver Streets (Alternative 1 segment)
- LRV technology from Franklin Park Zoo to Uphams Corner via Columbia Road (new alignment)

Mr. Brown stated that ridership projections generated for developed study alternatives were utilized to develop the alignments for this new alternative. Mr. Brown requested the consultants to develop ridership projections and a feeder bus network for the alternative. Dick Tilles agreed to do this. Mr. Brown stated that the basis for eliminating Alternative 6 was primarily due to problems of pollution, aesthetics, and community attitude toward buses.

6. Clark Frazier stated that we should be looking at a high platform vehicle similar to a modified LRV. This would render the issue of rapid transit versus LRV moot.

7. Peter Smith announced that the October 26 Project Working Committee Meeting will be held at the Boston City Hospital (4th floor auditorium).

OCTOBER 7, 1977

Attendees:

Polly Russell	SWCC	Craig M. Inge	GRDC
Patrick Cooke	CBT	Sue Clippinger	Mayor's Office
Tony Casendino	CBT	Melanie Ray	Boston O. P. D.
Ronald Cortiella	CBT	Clark Frazier	SECOT
Anne Marie Osterholm	CBT	Ralph Agee	R.M.S.C.
Peter Smith	CBT	Cecil Brown	SWCC
Karen Harr	BRA	Keith Alcantara	Roxbury APAC
Alice Gray	BRA	Leon Hines	Museum of Afro-
Jim Baecker	BRA		American History
Alfred Howard	BRA	Robert Lepore	TAMS
Rocco Mancini	MBTA	Dick Tilles	TAMS
Peter Calcaterra	MBTA		
Rosalind Horner	CBT		

1. Dick Tilles opened the meeting by stating that he wished to review (1) the feeder bus network for Alternative 11 (Mattapan to Essex, Rapid Transit; Ruggles - Dudley - Uphams Corner - Columbia Point, LRV; Dudley - Egleston - Franklin Park Zoo - Uphams Corner - Columbia Point, LRV), (2) ridership projections for Alternative 10 (Augmented Feeder Bus) and Alternative 9 (Ruggles - Dudley - Mattapan, LRV; Dudley - Downtown, Busway), and (3) MBTA and consultant recommendations for alternatives warranting further analysis in Phase II.

2. Cecil Brown listed corrections for the September 30 Coordination Meeting minutes and Dick Tilles said that the minutes would be amended accordingly.

3. Dick Tilles reviewed a feeder bus network developed for Alternative 11. Mr. Tilles stated that LRV station spacings for the Dudley - Egleston - Franklin Park Zoo - Uphams Corner alignment have been reduced in order to increase accessibility to surrounding areas. Clark Frazier stated that the feasibility of running rapid transit at partial grade along Blue Hill Avenue would cut capital costs and should be investigated.

Mr. Tilles asked the group if tying the rapid transit alignment into the Relocated Orange Line at Ruggles Station rather than at Essex Station (along Washington Street) would be preferred.

Clark Frazier stated that the required flyover resulting from branching the Orange Line at Ruggles Station would probably extend as far as New Dudley Street. Mr. Frazier further stated that the South End has almost written off subway in the South End due to construction problems outlined in the Harris E.I.S. for the Orange Line. Ralph Agee stated that the Roxbury community feels that the alignment from Downtown should be maintained along Washington Street at least as far as Dudley in order to minimize community fears that a new alignment (such as to Ruggles Station) would require substantial right-of-way acquisition.

4. Ralph Agee stated that he has a strong fear that no alternative from this study will be implemented once the elevated structure is removed. He stated that it is extremely important to have an MBTA commitment to implement the preferred alternative prior to the removal of the elevated structure. Clark Frazier concurred with Mr. Agee that the MBTA has not shown a commitment to the project. He stated that it is important for the consultants to provide enough data in order for the Study Area communities to get together and push for their preferred alternatives.

5. Craig Inge stated that at a recently held meeting with the Dudley merchants the consultants mentioned that rapid transit in tunnel provides lower visibility of commercial areas than LRV at-grade. Mr. Inge stated that this was a biased remark on the part of the consultants. Mr. Tilles disagreed and said that he was simply trying to state the pros and cons of each mode in the Dudley area.

6. Dick Tilles presented the consultants' recommendations for alternatives to be carried into Phase II. Mr. Tilles explained that the recommendations depict a series of transit segments that can be combined in a number of ways rather than complete transit packages. They are shown this way because Phase I analysis has indicated that many of the alignments shown are nearly equivalent in terms of cost-effectiveness and community acceptance. Mr. Tilles stated that the recommended transit segments are divided into four zones:

- Zone 1 (South End to Dudley Station)
Busway or LRV along Washington Street
- Zone 2 (Dudley To Grove Hall)
Busway or LRV along Warren Street or upper Blue Hill Avenue
LRV or Rapid Transit along Midland Branch RR
- Zone 3 (Grove Hall to Mattapan)
Busway or LRV along Blue Hill Avenue
LRV or Rapid Transit along Midland Branch RR
- Zone 4 (Crosstown)
Bus or LRV along links from Columbia Point through Uphams Corner and Dudley to the Fenway area.

Mr. Tilles stated that it is important to look at alternatives from a cost-effective viewpoint in order to get federal funding. Mr. Tilles further stated that the consultants plan to start Phase II with a closer look at some critical design, operations, and community acceptance issues which will eliminate many segments prior to the detailed rider analysis in Phase

7. Ralph Agee stated that it is important to keep in mind that Federal transportation policy has a history of vacillating from year to year. Therefore, the Study should recommend what the communities desire.

Mr. Tilles stated that it is important to look at these alternatives from a cost-effective viewpoint in order to get federal funding. Mr. Tilles further stated that the consultants plan to initiate Phase II with a closer look at some critical design, operations, and community acceptance issues which will eliminate many of the segments listed above prior to the detailed rider analysis in Phase II.

7. Ralph Agee stated that it is important to keep in mind that Federal transportation policy has a history of vacillating from year to year. Therefore, the Study should recommend what the communities desire.

8. Clark Frazier stated that a Warren Street alignment tied into the Midland Branch south of Grove Hall may be as cheap as the Dudley Street - Midland Branch alignment for rapid transit, in addition to providing direct service to Grove Hall. Mr. Frazier explained that rapid transit should not be considered along an alignment that does not provide direct connectivity with all major generators (Dudley, Grove Hall, Mattapan). Mr. Frazier stated that he would have preferred the consultants proposing four or five transit service packages rather than a series of transit segments. Dick Tilles replied that in essence the transit segments accomplish the same thing but with greater flexibility, i.e., "not locking ourselves into any particular alternative." Clark Frazier stated that each of the four zones reflect different issues and, therefore, they should be outlined in the final feasibility report.

9. Cecil Brown stated that the position of the Roxbury Caucus of the Southwest Corridor Coalition is to extend rapid transit to Mattapan via Blue Hill Avenue and not via the Midland Branch. Dick Tilles stated that the Midland Branch alignment generates slightly higher ridership than Blue Hill Avenue. However, the Blue Hill Avenue alignment provides greater commercial development potential. After some discussion, it was agreed to recommend both the Blue Hill Avenue and the Midland Branch rapid transit alignments south of Grove Hall with a Warren Street alignment tying into Ruggles north of Grove Hall.

OCTOBER 14, 1977

Attendees:

Patrick Cooke	CBT	Yong Chang	CTPS
Peter Smith	CBT	Sue Clippinger	Mayor's Office
Anthony Casendino	CBT	Melanie Ray	OPD - City of Boston
Clark Frazier	SECOT	Craig Inge	GRDC
Paul Porell	BRA	Paula Waters	Mayor's Office
Alice Gray	BRA	Leon Hines	Museum of Afro-
Peter Calcaterra	MBTA		American History
Robert Lepore	TAMS	Rocco Mancini	MBTA
Cecil Brown	SWCC		

1. Peter Calcaterra opened the meeting by stating that he wished to review (1) ridership projections for Alternative 9 (Ruggles - Dudley - Mattapan, LRV; Dudley to Downtown, Busway) and a modified Alternative 6 (Busway) and (2) the agenda for the October 26 Project Working Committee Meeting.

2. Yong Chang stated that modifications to Alternative 6 decreased by approximately 6 percent although automobile diversions increased by 12 percent. Mr. Chang attributed the decline in total ridership to reduced operating speeds in the ARZ (from 7 mph to 5 mph), and the increase in automobile diversions to improved crosstown services provided by Route N22 - Ashmont - Brookline Village. Mr. Chang estimated 3,400 daily one-way boardings for Route N22. Clark Frazier stated that this alignment looks good for high frequency bus service, and should be recommended as a short-term improvement.

Yong Chang discussed ridership projections for Alternative 9. Clark Frazier stated that the sensitivity of the ridership model to operating speed is clearly demonstrated by comparing the LRV in Alternative 5 to the bus in Alternative 9. Mr. Frazier stated that he was still concerned with areas of population within the South End that are not reflected in the CTPS model. Yong Chang stated it was decided at the beginning of the Study to resolve this issue in Phase II.

3. Tony Casendino stated that he had trouble discerning any significance in the alternative ridership projections. Peter Calcaterra agreed that ridership by itself is not very significant. Mr. Calcaterra explained that this will increase the relative importance of other criteria, i.e., accessibility, right-of-way, noise, long range goals, etc.

4. Cecil Brown wanted to know if the Phase I conclusions that will be sent to the UMTA would be made public. Peter Calcaterra stated that the Phase I report will list conclusions. Mr. Brown asked Mr. Calcaterra when Phase II will begin. Mr. Calcaterra stated that we should have UMTA reaction to Phase I by January with Phase II commencing in February.

5. Tony Casendino requested that the objectives of the October 26 Project Working Committee Meeting be clarified in order to understand what information is most appropriate for presentation. Peter Calcaterra stated that the primary purpose of the meeting is to present the Study findings and conclusions of the consultants to the community.

6. Clark Frazier stated that it is important to list the issues and problems (engineering as well as community) associated with each alignment and mode for each of the four study area zones. Mr. Frazier explained that this process would provide a good means for community reaction to the alternatives. Tony Casendino stated that the lists should also include opportunities and unknown factors associated with each alternative within the zones. Peter Calcaterra stated that anyone interested in contributing should submit their list of issues to CBT within the next couple of days in order to present a composite list for community review at the PWC meeting.

7. Peter Calcaterra asked the group if short-term recommendations should be added to the PWC Meeting agenda. Rocco Mancini stated that rather than adding to the confusion expected at the October 26 Meeting with the present agenda, meetings should be held between Phase I and Phase II to discuss short-term improvements and recommendations. The group agreed to this schedule.

8. Cecil Brown stated that it is exceedingly important to have an articulate person discuss the alternative strategies in order to avoid any confusion at the PWC Meeting.

Leon Hines suggested the use of an overhead projector and overlays to display the development of each alternative in order to facilitate the discussion of the alternative strategies. The group agreed with this technique.

9. Clark Frazier Disagreed with some of the language in the "Selection of Transit Alternatives for Phase II Analysis" memorandum. Mr. Frazier stated that the use of "takings" in conjunction with abandoned property along upper Blue Hill Avenue should be reworded.

OCTOBER 21, 1977

Attendees:

Patrick Cooke	CBT	Jim Baecker	BRA
Paul Porell	BRA	Yong Chang	CTPS
Paula Waters	Mayor's Office	Robert Lepore	TAMS
Leon Hines	Museum of Afro-American History	Peter Calcaterra	MBTA
Clark Frazier	SECOT	Peter Smith	CBT
Dick Tilles	TAMS	Rocco Mancini	MBTA
Cecil Brown	SWCC	Laverne Randolph	GRDC
Sue Clippinger	Mayor's Office		

1. Peter Calcaterra opened the meeting by stating that he wished to review (1) ridership projections for Alternative 11 (Washington-Warren-Blue Hill, Rapid Transit; Ruggles-Dudley-Columbia Point, LRV Crosstown Alignment; Dudley - Egleston-Franklin Park Zoo-Uphams Corner-Columbia Point, LRV Crosstown Alignment) and (2) the agenda for the October 26 Project Working Committee Meeting.

2. Yong Chang stated that Alternative 4 provides a means of evaluating Alternative 11 ridership. Mr. Chang stated that the decline in Alternative 11 crosstown ridership via Dudley (as compared to Alternative 4) is primarily attributed to competing services provided by the second crosstown alignment via Franklin Park Zoo. Mr. Chang further explained that Alternative 11 ridership projections exclude transfers (double boardings). Clark Frazier said that total boardings (including transfers) must be looked at in order to adequately determine the service requirements associated with each alignment. Dick Tilles agreed, but stated ridership projections excluding transfers are necessary to determine feasibility. Mr. Tilles agreed to tabulate ridership with and without transfers for all alternatives.

3. Clark Frazier requested the consultant's recommendation for Alternative 11. Dick Tilles stated the crosstown alignment via Franklin Park and rapid transit alignment segment on Washington Street should be dropped prior to Phase II because of insufficient travel benefits in relation to costs.

4. Yong Chang stated that bus diversions for Alternative 4 (14,450 diversions) were incorrect and will be modified.

5. Peter Smith distributed the agenda for the October 26 PWC Meeting. Peter Calcaterra stated that the agenda includes 30 minutes for Study background and recommendations. Peter Smith stated that questions will be entertained at the conclusion of this 30 minute presentation leading to a PWC consensus on Phase I recommendations.

6. Peter Calcaterra conducted a brief trial run of the presentation technique (overhead projector with overlays) to be used at the PWC Meeting to describe the recommended and eliminated alternatives. Mr. Calcaterra assured the group that an explanation will be provided for each alternative recommended for elimination. Mr. Calcaterra stated that a list of critical issues to be addressed in Phase II will be distributed at the end of the PWC Meeting.

7. Laverne Randolph asked if there was a commitment to implement the replacement service prior to the demolition of the Orange Line elevated. Peter Calcaterra stated that it depends upon the alternative recommended for implementation, i.e., the elevated structure could inhibit construction of a transit alternative under it. He also said that interim bus service would be provided.

8. Rocco Mancini asked if anyone had researched the amount of cash flow available to construct the recommended alternative. Peter Calcaterra stated that the Transportation Improvement Program (TIP) has specified an amount of capital funds available for the replacement service. Clark Frazier stated the source of these funds remains unclear as they appear to be committed to other projects. Sue Clippinger stated that State transit priorities could be changed if these other transit projects impose fiscal limitations to this Study. Peter Calcaterra stated that Phase II will adequately address these issues.

OCTOBER 28, 1977

Attendees:

Pat Cooke	CBT	Ken Kruckemeyer	MBTA
Bob Lepore	TAMS	Cecil Brown	SWCC
Sue Clippinger	Mayor's Office	Paula Waters	Mayor's Office
Tony Casendino	CBT	Pat Brennan	TAMS
Al Sopyla	CTPS	Ralph LeBeau	BRA
Peter Smith	CBT	Leon Hines	Museum of Afro-
Dick Tilles	TAMS		American History
Paul Porell	BRA	Craig Inge	GRDC
Melanie Ray	Boston OPD	Peter Calcaterra	MBTA
Clark Frazier	SECOT		

1. Peter Calcaterra opened the meeting by stating that he wished to review (1) a schedule for completing Phase 1 and (2) modifications to the consultant's original Phase 1 recommendations that were requested at the October 26 Project Working Committee meeting.

2. Mr. Calcaterra listed several modifications to the consultant's recommendations requested at the PWC meeting and asked if this summary list was valid. Clark Frazier stated that the PWC meeting process after the PWC meeting break was invalid due to the late hour and reduced attendance. Mr. Frazier stated that carrying an LRV alignment on Washington Street south of Dudley Station and a rapid transit option into Phase II will only cause delay in getting into Phase II. Paul Porell stated that he considered recommendations for Zone 1 valid. Cecil Brown stated that Mr. Calcaterra's list of recommendations essentially follow requests made at the PWC meeting.

3. Clark Frazier stated that the Project Working Committee meeting was not a proper forum for reaching community consensus. Since the October 26 meeting was the first areawide meeting which presented Phase I recommendations, most people were not adequately prepared to respond to the recommendations. Tony Casendino stated that it was significant that many new people attending the meeting reviewed and discussed the recommendations, which will have a considerable impact on the process for Phase II. Clark Frazier asserted that listing recommendations based on several discrete transit strategies and then presenting these strategies at many public meetings would provide a more valid process for achieving community consensus. Mr. Frazier briefly summarized four transit strategies including bus, LRV and combinations of both modes. Dick Tilles agreed with Mr. Frazier that the process for reaching community consensus could be improved, but stressed the need to submit a Phase I feasibility report to the UMTA without causing a serious time delay. Mr. Tilles said that developing transit strategies prior to more detailed engineering analysis on some alignments would not be a worthwhile exercise.

3. Clark Frazier stated that the real Phase I issue is maintaining or dropping the rapid transit option. Mr. Frazier stated the MBTA should drop this option and document the reasons for doing so. Mr. Frazier again asserted that maintaining this option would seriously delay Phase II. Sue Clippinger suggested that Zone 1 (where rapid transit is not proposed) be studied separately from Zones 2 and 3 during Phase II in order to expedite implementation of a replacement service in the South End.

4. Tony Casendino suggested that an informational kit listing study recommendations and issues could be prepared and distributed throughout the study area in order to receive a broader consensus of Phase I recommendations. Peter Calcaterra stated that he would review this proposal to see what could be accomplished prior to the next Project Working Committee meeting.

NOVEMBER 4, 1977

Last Regularly Scheduled Friday Morning Meeting
at Site Office

Attendees:

Bob Lepore	TAMS
Tony Casendino	CBT
Yong Chang	CTPS
Peter Smith	CBT
Dick Tilles	TAMS
Paul Porell	BRA
Clark Frazier	SECOT
Cecil Brown	SWCC
Leon Hines	Museum of Afro-American History
Craig Inge	GRDC
Paula Waters	Mayor's office

1. Dick Tilles opened the meeting by stating that he wished to review (1) a new ridership table prepared by CTPS and (2) MBTA options for accepting the Phase I results to date. He explained that MBTA Project Manager Peter Calcaterra was unable to attend the meeting due to illness in his family.

2. Yong Chang presented a table listing total ridership for each alternative. Ridership presented in the table reflected total transit boardings on each alternative without eliminating double counts or system transfers. The table was requested at a previous Coordination Meeting.

3. Dick Tilles stated that the MBTA was presently reviewing both the consultant's recommendations for alternatives to be carried into Phase II and requests made at the Project Working Committee (PWC) Meeting to modify the recommendations. Mr. Tilles explained that two options were available to the MBTA:

- (1) Accept all Project Working Committee requests to modify the consultant's recommendations, which would require no additional Project Working Committee to be held during Phase I, or
- (2) Revise the recommendations and schedule a PWC Meeting, probably in December.

To provide additional information to the MBTA, Mr. Tilles is now drafting the Phase I Feasibility Report. Two reports will be prepared as part of Phase I: an all-inclusive report to be available to selected agencies and groups, and a 7-8 page summary report available for widespread distribution.

4. Dick Tilles stated that this would probably be the last Coordination Meeting during Phase I, unless the Urban Mass Transportation Administration (UMTA), upon reviewing the Feasibility Report, recommended modifications. If UMTA were to recommend changes to the Phase I document (probably in January or February 1978), a Coordination Meeting would be scheduled. In any event, Mr. Tilles assumed an additional Coordination Meeting would be scheduled early next year to review both the Phase II work program and the status of the UMTA Phase I review.

5. Clark Frazier expressed his concern that MBTA approval of all Phase I recommendations would require an augmented Phase II budget and subsequently a delay (one year) of Phase II. Mr. Frazier further stated that the present status of both the Relocated Orange Line and Red Line Northwest Projects would preclude any hard decisions by the MBTA concerning Phase I recommendations. Dick Tilles said the consultants and the MBTA will be in touch with the community concerning the status of UMTA review and any protracted delays.

6. Cecil Brown felt another Project Working Committee Meeting was necessary to get the community up to date and because another meeting was promised at the October 26 PWC Meeting.

7. Paul Porell asked if the Phase II budget would have to be increased to the extent of possibly causing a delay should all recommendations be approved. Dick Tilles responded that he would not know until the Phase II work program was written.

8. Paul Porell explained that it would make sense to schedule a meeting with UMTA representatives within the next two weeks (week before Thanksgiving) in order to understand the methodology that will be used by the UMTA to review and approve the Phase I Feasibility Report. Dick Tilles agreed to communicate this request to Peter Calcaterra.

9. Clark Frazier conveyed several ideas for maintaining and strengthening the Community liaison process during Phase II:

- Coordination meetings have been successful during Phase I and should be continued (Friday mornings were acceptable to the group) with at least one community representative from each zone of service: South End, Roxbury, Dorchester-Mattapan attending.
- Specific study issues should be discussed in detail at the zone level, i.e., periodic meetings held within each zone to discuss the issues of that sub-area.
- Small neighborhood meetings should be a direct outgrowth of the issues discussed and raised at the zone level.

- Project Working Committee meeting should be held to make broad decisions involving two or more zones.

Dick Tilles generally agreed with this process outline for Phase II. Tony Casendino said that he would have to review the Phase I effort before making recommendations on the Phase II community liaison process.

10. Paul Porell asked if work on short-term bus improvements would be continued between Phase I and II. Dick Tilles explained that Peter Calcaterra was discussing this prospect with Carlos Diaz of MBTA Community Affairs and Marketing.

JANUARY 13, 1978

Attendees:	Peter Calcaterra	(T) Southwest
	Paula Waters	Mayor's Office
	Paul Porell	BRA
	Peter H. Smith	CBT
	Gloria K. Moore	CBT
	Dick Tilles	TAMS
	Cecil G. Brown	SWCC
	Clark Frazier	SECOT
	Anthony B. Casendino	CBT
	Ken Kruckemeyer	(T) SW Cor.
	Sue Clippinger	Mayor's Office
	Shirley Simpson	(T) Oper. Ping.
	John Morrison	SEPAC
	Ralph Agee	RMSC
	Craig M. Inge	GRDC
	Carlos Diaz	MBTA

1. Peter Calcaterra stated that the purpose of today's meeting was to prepare for the upcoming January 31st PWC meeting and to discuss publication of the Phase I feasibility report. He said that the Phase I report might not be submitted to UMTA until after the PWC meeting. This would permit the meeting's minutes and community comments to be incorporated in the report.

2. Sue Clippinger objected to any delay in submitting the report to UMTA. She said that it was important to get the approval process underway so that Phase II could be started as soon as possible.

3. Peter Calcaterra asked for comments on the draft copy of the Phase I report which had been submitted to most of the participants at the meeting.

4. Ralph Agee said that he was concerned about dropping rapid transit options prior to Phase II. He felt that the Phase I report did not adequately document the reasons for dropping rapid transit. He would be more willing to accept the recommendations , if these reasons could be stated better.

5. Dick Tilles said that he would rewrite the section of Chapter 10 relating to rapid transit and go over it with Ralph Agee, Craig Inge, Clark Frazier and Cecil Brown prior to publication of the report.

6. Ralph Agee asked how it was possible to justify rapid transit on the relocated Orange Line and not on Blue Hill Avenue, particularly since more people lived in the replacement study corridor than along the railroad corridor. Ken Kruckemeyer said that rapid transit on the relocated Orange Line has higher ridership than replacement options because it not only gets patrons along its length, but also is very heavily loaded from communities south of Forest Hills Station, such as Roslindale, Hyde Park and Dedham. These patrons take bus or auto to Forest Hills. Mattapan Square, the terminus of replacement options, would only pick up persons from the relatively low density areas of Milton and lower Mattapan.

7. Clark Frazier stated that he agreed with the contents of the Phase I report and with its recommendations. He asked that in Phase II several issues be looked into further. Specifically, he asked that an interest rate other than six percent in estimating operating costs be used and that, when the busway on Seaver Street is evaluated, the possibility of upgrading it in the future to light rail is also considered. Peter Calcaterra indicated that both will be done.

8. It was decided that the feasibility report would be issued after the January 31 PWC meeting and that community comments would be incorporated in it. Ralph Agee said that a week should be allowed after the meeting for receipt of comments.

COMMENTS ON PHASE I RECOMMENDATIONS

Comments on the recommendations made in Chapter 10 of this report were solicited from the community prior to and during the January 31, 1978 Project Working Committee meeting. The suggestion form shown on the next page was mailed to all the study mailing list and distributed at the meeting.

Comments received prior to publication of this report follow.

Mr. Lawrence R. Renfroe
32 Hall Street
Jamaica Plain, Ma. 02130

I disagree with the recommendations of the Phase I Report.

Commuter rail via Midland Branch is too costly for the few it would serve. Electrify the branch as Riverside was done in 1959 for light rail. Consider keeping and rebuilding more P.C.C. cars for this service. Concentrate on light rail along Washington Street to Dudley then via Warren Street and Blue Hill Avenue at Mattapan Square with a connector to U. Mass, Boston, and Huntington Avenue. Note that existing car facilities at Arborway could serve these routes. Add more feeder buses. Busway is not as attractive to potential users.

Mr. Robert H. Haas
29 Monadnock Street
Dorchester, Ma. 02125

I disagree with the recommendations of the Phase I Report.

There is no adequate direct link between Uphams Corner and downtown - Zone 1. Service through Dudley, presently the best of the options, has always been inadequate. A railroad link on the Midland tracks to South Station will be a much needed improvement. However, if LRV service is the ultimate choice for the Midland tracks (Zone 3), Uphams Corner users should not be subjected to riding the length of Dudley Street to Dudley Station (Zones 2 & 4) and then along Washington Street to enter the Green Line at Boylston.

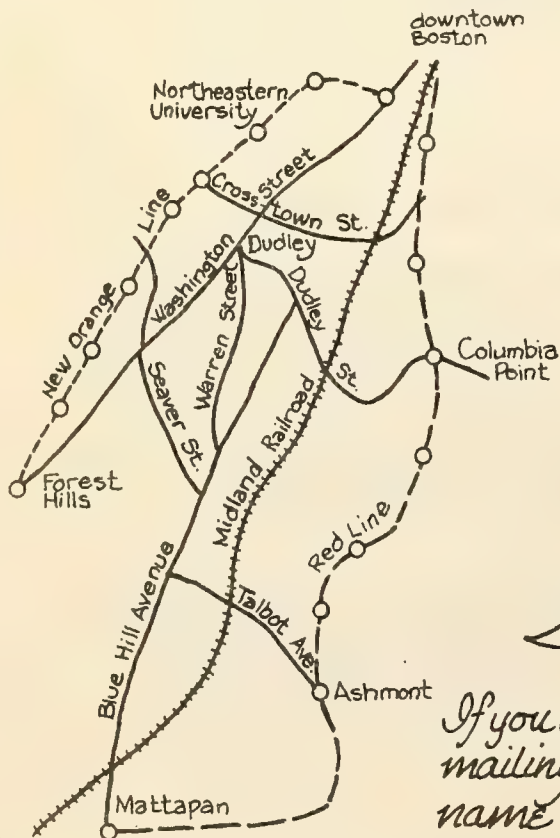
Service on the Midland Branch is needed in any form. In particular, LRV service on the Midland Branch should link to Boylston-Park Street directly. Crosstown service (LRV) is good as proposed (Columbia Point - Uphams Corner - Dudley - Ruggles - Northeastern) but should continue to Cambridge - preferably to Central Square.

my suggestions:

- ☐ I agree with the recommendations of the Phase I report
- ☐ I disagree with the recommendations of the Phase I report

because: _____

I would like to make the following SUGGESTIONS for Phase II
of the Study _____



PLEASE USE THIS MAP TO MAKE
ROUTE CHANGES AND SUGGESTIONS

If you desire to be on the study
mailing list, please put your
name and address here _____

Please make a note of your ideas above... then fold tape and mail

3

Mr. James E. Cofield, Jr.
52 East Springfield Street
Boston, Ma. 02118

I disagree with the recommendations of the Phase I Report.

LRV's in tunnels would be much better than in a median or buses on a busway. LRV's are a very good solution. It is just that below-the surface vehicles solve all of the negative factors associated with surface vehicles. Further study should be done to put LRV's in tunnels and see if it can be implemented. It would substantially improve development potential for the affected areas.

Gareth Kinhead
Messinger St. Citizen Association
54 Messinger Street
Mattapan, Ma. 02126

The service from Mattapan to Egleston and Jackson Square I feel will better serve the interests of the community by using bus service. In the interest of the environment, possibly a bus that operates by battery instead of gas or diesel fuel could be used. LRV's on Blue Hill Avenue would bring back the tracks and noise. Blue Hill Avenue should become more of an avenue of beauty with trees, homes, businesses, etc. Security must be written-in with your plans. Public transportation service can be the best in the land - but if people are in fear of being beaten, robbed, raped, etc., then you will find no takers. Let me make the point by using a Chinese proverb: "Firewood alone will not start a fire".

Edward R. Redd
15 Kenelworth Street
Roxbury, Ma. 02119

In Zone 1, buses only should be used. Wherever LRV's are used, they should be confined to tunnels or in existing railroad right-of-way. In this modern society, any permanent structure that would detract from the beauty of a surrounding should be underground. This may cost more initially, but would be worth the investment in the long run.

Resident
128 Union Park Street
Boston, Ma. 02118

It is not clear from the brochure whether or not the cost analysis for rapid transit considered costs on a long-term basis, taking into account such things as snow removal, vehicle derailment in cold weather, and other comparative maintenance costs. In addition

Resident, 128 Union Park St. (cont'd)

to the advantages summarized, underground stations are both warmer and safer.

Bus service on Washington Street should be out of the question. The pollution in that area is already terrible, and the buses themselves are almost always filled with exhaust fumes. Noise and poor schedule adherence are additional reasons not to use buses.

Mr. John A. Vitagliano
Housing Inspection Department
City Hall - Room 809
Boston, Ma. 02201

I agree with the recommendations of the Report.

Mr. Timothy Anderson
Franklin Park Zoo
Boston, Ma. 02121

I agree with the recommendations of the Report.

With roughly 750,000 people expected to attend the zoo by 1982 (estimated by Economic Research Associates), it would help both the zoo and the visiting public to have a easy public means of getting to it. Possibly a "Zoo" stop similar to the existing "Aquarium" stop on the Blue Line.

Mr. Hector Ruiz
Cooper Community Center
1891 Washington Street
Roxbury, Ma. 02119

I agree with the recommendations of the Phase I Report.

All factors needed to evaluate the various alternatives are covered extremely well in the scope and range of the project. Phase I is the culmination of all the groups' ideas and its approval is most needed. All the technical excellence of companies such as TAMS, CBT, and GRDC will be reflected in a new and modern system so needed in Boston.

I would like to see Dudley Station modernized and become a central depot for connecting lines. The LRV's are beautiful vehicles because of comfort and convenience and are quieter than buses. Briefly - LRV's for Blue Hill Avenue to Mattapan and South End to Downtown are my choices.

3

Arthur Hooper
725 Tremont Street #410
Boston, Ma. 02118

I agree with the recommendations of the Phase I Report.

I would like to know if there are going to be stations with collectors to make change and MBTA employees to help the older people at night.

Ann Hershfang
64 W. Rutland Square
Boston, Ma. 02118

I agree with the recommendations of the Phase I Report.

In my opinion, the two recommendations for the South End make political sense, although I would have preferred LRV's in a reservation and not buses on a busway.

APPENDIX B: TRANSIT RIDER SURVEY

(Prepared by the Central Transportation Staff)

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SUMMARY OF FINDINGS

In early June of 1977, a survey was conducted of riders boarding nine selected MBTA rapid transit stations between 7:00 and 10:00 a.m. The stations surveyed were Forest Hills, Green, Egleston, Dudley, Northampton and Dover on the Orange Line, and Ashmont, Fields Corner and Andrew on the Red Line. The survey was conducted to provide participants in the Replacement/Transit Improvement Study with up-to-date knowledge of the origins, destinations and other characteristics of current transit riders.

Origins and Destinations

During the survey period, about 13,000 persons boarded the six Orange Line stations, and about 8,400 persons boarded the three Red Line stations. Over 90% of the Orange Line riders surveyed and nearly three-fourths of the Red Line riders surveyed started their trips within the City of Boston. More than 80% of the Orange Line riders and over 70% of the Red Line riders had destinations in Boston Proper (that is, within Massachusetts Avenue). Back Bay represents a much larger share of the travel bound for Boston Proper for the Red Line ridership than it does for the Orange Line ridership (15.3% vs. 6.6%). There are two explanations for this: (1) it is more time consuming for Orange Line riders to reach Back Bay using the Green Line (westbound) than it is for Red Line riders, and (2) some potential Orange Line riders use the Arborway Branch to reach Back Bay. Although Charlestown, Everett and Malden are within easy reach of the Orange Line, only a small percentage of the riders surveyed reported these areas as destinations.

Since 1963, boardings at the six Orange Line stations have fallen by 32% (source: 1963 Transit Postcard Survey). The decline rate for boarders from West Roxbury, Roslindale and outer Southwest communities greatly exceeds this overall decline rate. The number of Orange Line boarders coming from Jamaica Plain, Hyde Park and Dedham has remained the same since 1963. The change in Red Line boardings since 1963 (a decline of over 50%) reflects a diversion of ridership to the Quincy Extension.

The share of riders boarding at the Orange and Red Line stations who are bound for Back Bay has grown since 1963. This is due to increased employment and retail activity in the Back Bay. The deterioration of Arborway Branch service and subsequent diversion of Back Bay bound riders to the Orange Line also explains the growth of the Back Bay share of destinations for Orange Line riders.

Auto Ownership and Dependency on Transit

A high percentage of Orange and Red Line riders are "captive"--they have no choice other than taking public transportation. Over 26% of the Red Line users surveyed and 32% of the Orange Line users surveyed came from households with no automobile. Surveys conducted in other parts of metropolitan Boston show significantly higher rates of auto ownership among transit ridership. The percentage of Blue Line patrons coming from households with no automobile is 17%. The Blue Line serves a predominantly urban market. Auto ownership levels for users of transit services in the suburbs is much higher. A survey of riders boarding the Green Line and the MBTA express bus services operating from Riverside showed that 4% of the Green Line riders and less than 2% of the express bus riders came from households where no automobile was operated or available.

Trip Purpose

On both lines, the vast majority of riders, about 95%, were coming from their homes. About 80% were traveling to work, and about 8%, to school. The remaining riders were going home, shopping, or to a medical location.

Mode of Access and Departure

Over half of the Orange Line riders arrived at the line by bus, with another one-fourth walking, and about 18% driving or being driven to their station. About 73% of the Orange Line riders left the line by walking, with another 20% transferring to another part of the rapid transit system, and about 7% leaving the Orange Line by bus. Six percent transferred two times after leaving the Orange Line.

Bus and, at Ashmont, trolley were the major modes of access to Red Line stations surveyed. Sixty-two percent of the Red Line riders left the line by walking.

Another 29% transferred to another part of the rapid transit system upon leaving the Red Line. Two percent transferred two times after leaving the Red Line.

Comments About Service

The survey respondents most frequently cited not enough trains, poor condition of trains, poor condition of stations and poor quality of service in winter as their concerns with the rapid transit service. Only about 6% of the respondents said that they were satisfied with the service. None of the respondents who had to transfer to the Green Line to complete their trips reported satisfaction. Most of the comments mentioning bus service dealt with poor schedule adherence and inadequate frequency.

1.0 INTRODUCTION

1.1 PURPOSE

This is one of a series of technical memoranda produced by the Central Transportation Planning Staff (CTPS) for the Replacement/Transit Improvement Study for the South End, Roxbury, Dorchester and Mattapan. The purpose of a technical memorandum is to document the procedures and results of a particular work task, so that the information is accessible to all participants of the study.

The purpose of this technical memorandum is to disseminate the information obtained from the transit rider survey, which was conducted to identify characteristics of current transit users in the study area. Separate memoranda describe the results of the market analysis and travel forecasts performed as part of the study.

1.2 DATA ITEMS COLLECTED

In early June of 1977, a survey was conducted of riders boarding the MBTA rapid transit system at nine selected stations between 7:00 and 10:00 a.m. The stations surveyed were Forest Hills, Green, Egleston, Dudley, Northampton and Dover on the Orange Line, and Ashmont, Fields Corner and Andrew on the Red Line.

Attachment A is a copy of the form distributed to riders. The survey was conducted to provide participants in the Replacement/Transit Improvement Study with up-to-date information on the origins and destinations of transit users in the study area. The survey was also intended to be a source of current data on mode of access to transit stations and on mode used from transit stations. Information on trip purpose was collected. The survey form asked several demographic questions which dealt with age, occupation, auto ownership and type of fare paid. Comments on the service were also requested on the survey form.

1.3 BACKGROUND INFORMATION ON PREVIOUS SURVEYS AND STUDIES

Origin and destination information was last collected on a large scale in two efforts. As part of the 1963 Transit Postcard Survey, information was collected from persons using the public transportation system. In that survey, information on submode (transportation mode to and from the transit system), station or stop of boarding and alighting, trip purpose, auto ownership, driver's license and trip frequency was gathered in connection with the transit trip being made at the time of the survey. In the 1963 Home Interview Survey, data was gathered from residents living in the Eastern Massachusetts Regional Planning Project (EMRPP) study area. In that survey, origin-destination, submode, trip purpose and demographic data were collected for all travel by all members of selected households on a specific day. The information collected in the 1963 Postcard Survey and the 1963 Home Interview Survey serves as the basis for models used to predict travel behavior in the Replacement/Transit Improvement Study. The origin-destination information obtained from the 1977 survey will assure the accuracy of these travel forecasting models before they are used in this study.

Information on ridership levels on the rapid transit system and on MBTA buses has been compiled as part of the CTPS/EOTC Transit Marketing Study. This study presented data on overall trends in public transportation usage between 1965 and 1976, as well as changes in boardings at individual stations. Surveys of ridership of specific bus routes have been conducted recently by the MBTA Department of Community Affairs and Marketing. Demographic and origin-destination information is gathered in this on-going effort to survey bus riders.

The 1970 U.S. Census collected information on auto ownership, income, household size, age and other demographic characteristics for all U.S. residents. These items are usually available on a census tract or block level. Information on travel to work was collected by the Census in 1970.

1.4 VALUE OF DATA COLLECTED BY THE SURVEY IN THE REPLACEMENT/TRANSIT IMPROVEMENT STUDY

The information gained from the survey is necessary to answer the detailed questions about transit options under consideration in Phase II of the Replacement/Transit Improvement Study. Estimates of use of submodes in connection with each option will be developed in Phase II. Data from this survey will be useful as a

basis for these estimates. The survey has given MBTA planners feedback on travel patterns of transit users and on problems current riders experience.

2.0 PROCEDURES FOLLOWED IN CONDUCTING THE SURVEY

2.1 DAYS, TIMES AND PLACES OF THE SURVEY

The survey was conducted between 7:00 and 10:00 a.m. on June 7, 8 and 9, 1977. On June 7, survey forms were distributed to persons boarding the Orange Line at Forest Hills, Green and Egleston stations, and on June 8, boarders at Dudley, Northampton and Dover received survey forms. On June 9, Red Line riders boarding at Ashmont, Fields Corner and Andrew were surveyed. The three survey days fell in the middle of the work week (Tuesday through Thursday). The weather on these days was somewhat uniform. It was colder than average for early June. Light to moderate rain fell on the morning of June 7.

2.2 SURVEY DISTRIBUTION AND RESPONSE

At each station the survey forms were distributed to inbound and outbound rapid transit boarders immediately after they had passed through the turnstile area. At the terminal rapid transit stations, Ashmont and Forest Hills, forms were given to inbound boarders. At Ashmont, forms were passed out to inbound Red Line riders and not to outbound riders of the Mattapan High Speed Line.

The forms had serial numbers. At each station the sequence of forms distributed was recorded. The station of boarding corresponding with each response could be determined by the serial number on the survey form.

The survey form was printed on a hard 8½" x 11" card (see Attachment A). The reverse side of the form was a business reply mail card. Survey respondents could mail their forms to the MBTA. If the survey respondent had sufficient time to complete the form before boarding a rapid transit car, the form could be returned to a member of the survey team at the boarding station. The form could also be returned to specially identified survey collectors at downtown transit stations on the morning of the survey.

A total of 16,500 forms were handed out during the survey. There were 4,700 cards returned, which represents 28.5% of all forms distributed. Approximately 540

forms were completed before the respondent boarded the rapid transit and about 860 forms were returned to survey personnel at the downtown transit stations. The remaining 3,300 forms were returned by mail.

Table 2-1 shows information on the number of passengers using each station on the morning of the survey and on the number of forms distributed and returned on a station by station basis. Coverage, represented by survey cards distributed divided by the number of persons boarding at a station, varied from station to station. At low volume stations, coverage was high. For stations with less than 3,500 morning period boarders, between 80% and 95% of all boarders were given survey forms.

Forest Hills and Ashmont had lower coverage than the rest of the stations surveyed. This was due to a number of factors. Both stations are terminals. When a train is waiting at the platform, riders entering the platform tend to rush to the train. They do not know whether the train is just about to leave and are less willing to slow down to accept a survey. (The members of the survey teams were instructed that while their purpose was to give out forms, they were not allowed to impede passenger movement.) When a train is not at the platform, the volumes are so great that platforms fill with boarders and distribution of forms becomes difficult. Finally, a large share of the arrivals at Forest Hills and Ashmont are by feeder bus or streetcar and are not distributed evenly over time. A loaded bus or streetcar can drop off 50 or more people at the station at once.

It can also be seen from Table 2-1 that the percent return (cards returned divided by cards distributed) varied from 38% at Green to a low of 18% at Dudley. The overall rate of coverage was 77.1%. The overall rate of return was 28.5%. This means that the number of forms returned represented 22.0% of the number of persons boarding at the stations during the time of the survey.

2.3 PROCEDURES TO COUNT TOTAL BOARDINGS AT STATIONS

At each station, during the morning of the survey, personnel recorded the total number of persons boarding. These volumes were recorded every 15 minutes. Passengers using turnstiles were counted by reading the passometers. Passengers using the pass gates or cash boxes were counted separately with hand counters. Special forms for recording turnstile readings were prepared for each station prior to the survey. These forms had a schematic of the bank of turnstiles and

Station of Boarding	Total Entering Passengers	Total Cards Distributed	% Coverage	Total Cards Returned	% Return
Forest Hills	6,076	3,793	62.4%	1,267	33.4%
Green	540	487	92.0	188	38.6
Egleston	1,448	1,346	92.9	276	20.5
Dudley	3,335	2,815	84.4	517	18.3
Northampton	753	716	95.0	194	27.1
Dover	860	705	82.0	162	23.0
Ashmont	5,006	3,699	73.9	1,401	37.9
Fields Corner	1,786	1,510	84.5	405	26.8
Andrew	1,639	1,471	89.7	303	20.6
Totals	21,443	16,542	77.1%	4,713	28.5%

*%coverage is total cards distributed divided by total passengers entering.
 **%return is total cards returned divided by total cards distributed.

TABLE
2-1

BOARDINGS OBSERVED (7AM-10AM),
DISTRIBUTION RATES, AND RESPONSE RATES

serial numbers for each turnstile and cash box. The forms reduced the possibility of error and enabled results to be cross-checked after the survey. The number of persons counted boarding at each station is shown in Table 2-1.

2.4 EXPANSION FACTORS

To compensate for the variation in response rates between riders boarding at the different stations, each survey response was weighted according to station of boarding. These expansion factors* are shown in Table 2-2. Using these factors, it was possible to bring total responses to any question up to a "control total" equal to total persons counted boarding during the survey period. The results described in Section 3 are based upon expansion of survey responses by these factors.

The completed responses to any particular question on the survey form had to be further expanded to compensate for respondents who failed to answer the question. In other words, responses to particular questions had to be weighted by factors larger than those shown in Table 2-2 to reach to control totals, because some respondents did not answer all questions on the survey form. Most questions were completed by all but a few respondents (typically one to three percent non-response). The questions dealing with origin and destination had significant rates of non-response. About 70% of the respondents answered both the origin and the destination question.

2.5 SURVEY DATA FILE

Appendix B is a listing of the items in the survey data file. Coding used in the data file is also described in this appendix.

* The Expansion Factor is equal to the number of passengers actually boarding at a station divided by the number of questionnaires received from passengers boarding at that station.

<u>Station</u>	<u>Expansion Factor</u>
Forest Hills	4.80
Green	2.87
Egleston	5.25
Dudley	6.45
Northampton	3.88
Dover	5.31
Ashmont	3.57
Fields Corner	4.41
Andrew	5.41

EXPANSION FACTORS

TABLE
2-2

3.0 SURVEY RESULTS

3.1 DEMOGRAPHIC ITEMS

During the survey period, about 13,000 persons boarded the six Orange Line stations and about 8,400 persons boarded the three Red Line stations.

3.1.1 Occupation

Table 3-1 shows information on the occupation of the transit riders. The majority (63%) of the transit riders classified themselves as either clerical or professional workers, although relatively few professionals boarded at Dudley, Egleston, Fields Corner or Andrew. Students make up about 11% of all boarders, with larger proportions of students at Fields Corner, Egleston and Dudley.

3.1.2 Age

Information on the age of the transit riders is shown in Table 3-2. Overall, about 5% of the boarders are 17 years of age or less, with considerable variation between proportions for individual stations. The overall share of boarders under 18 at Red and Orange Line stations is not extraordinarily large or small. A survey conducted by CTPS as part of the North Shore Transit Improvement Project found that Blue Line ridership under 18 years of age represents less than 3% of all boarders. Another survey conducted by CTPS as part of the Riverside Station Improvement Study showed that about 5% of all Green Line boarders at Riverside are under 18 years of age. Both surveys were conducted in late spring of 1977 during morning peak periods.

About 5% and 4%, respectively, of the Red Line and Orange Line boarders surveyed are 65 years of age or older. These overall percentages are neither unusually high nor low. About 2% and 4%, respectively, of the Blue Line and the Riverside Station (on the Green Line) boarders are 65 years of age or older. Typically, the elderly make up greater portions of the transit ridership during midday than during peak periods. The shares of daily boardings by riders 65 years of age or older would probably be greater than the shares shown in Table 3-2.

Station of Boarding	Factory	Craftsman/ Foreman	Clerical	Housewife	Unemployed	Professional	Student	Retired	Sales	Domestic	Other
Forest Hills	1.5	2.6	37.7	2.1	0.9	32.6	5.5	1.4	3.9	0.9	10.9
Green	5.0	5.0	24.6	1.1	2.8	32.4	10.1	0.6	1.1	2.2	15.1
Egleston	5.5	1.6	37.5	0.8	1.6	22.9	15.8	0.4	1.6	3.2	9.1
Dudley	7.9	2.1	36.3	1.9	1.5	17.6	14.3	1.2	2.9	4.1	10.2
Northampton	4.9	3.3	23.0	0.0	3.8	36.1	11.5	2.2	2.7	2.2	10.4
Dover	3.7	0.6	24.7	0.6	1.2	41.4	11.7	0.0	3.7	0.0	12.3
Orange Line Surveyed*	4.1	2.4	35.1	1.7	1.4	28.5	9.8	1.2	3.2	2.0	10.8
Ashmont	2.3	2.7	37.3	1.3	0.9	30.6	9.5	1.5	4.4	1.4	8.1
Fields Corner	3.6	3.1	34.9	2.3	2.3	17.8	17.8	2.3	1.8	1.3	12.7
Andrew	4.7	1.4	34.8	2.5	1.4	20.3	10.9	2.2	3.3	2.9	15.6
Red Line Surveyed*	3.1	2.6	36.3	1.7	1.3	25.9	11.5	1.8	3.6	1.7	10.5

*Total percentages for each line are based upon survey results expanded to reflect number of boardings at each station.

TABLE
3-1

OCCUPATIONS OF TRANSIT RIDERSHIP
(IN PERCENTAGES)

Station of Boarding	Age Group					
	<u>17 or under</u>	<u>18-24</u>	<u>25-44</u>	<u>45-59</u>	<u>60-64</u>	<u>65 or over</u>
Forest Hills	1.7	19.5	36.7	27.9	8.0	6.1
Green	5.5	23.2	48.6	14.9	4.4	3.3
Egleston	8.9	31.7	41.3	13.5	3.9	0.8
Dudley	8.6	32.0	39.2	16.0	2.1	2.1
Northampton	5.3	24.2	55.3	9.5	3.7	2.1
Dover	7.9	19.4	57.6	12.7	1.8	0.6
Orange Line Surveyed*	5.0	24.5	40.8	20.7	5.2	3.8
Ashmont	2.5	27.0	37.9	22.1	5.9	4.6
Fields Corner	13.6	30.8	29.3	18.5	4.4	3.3
Andrew	6.2	28.3	30.8	23.6	5.1	6.2
Red Line Surveyed*	5.6	28.0	34.7	21.6	5.4	4.7

*Total percentages for each line are based upon survey results expanded to reflect the number of boardings at each station.

Note: This information is based upon results of a survey conducted in June, 1977. Hours of the survey were 7 AM to 10 AM.

3.1.3 Auto Ownership

A high percentage of Orange Line and Red Line riders are "captive"--they have no choice other than taking public transportation. Table 3-3 presents information on auto ownership rates. Over 26% of the Red Line users surveyed come from households with no automobile. For Orange Line riders this percentage is 32%. Auto ownership rates are lowest among riders boarding at Dudley and Northampton.

Surveys conducted in other parts of metropolitan Boston show significantly higher rates of auto ownership among transit ridership. The percentage of Blue Line patrons coming from households with no automobile is 17%--almost ten percentage points below the number for the Red Line and fifteen points below the number for the Orange Line.

The Blue Line serves a predominantly urban market. Auto ownership levels for users of transit services in the suburbs are much higher. A survey of riders boarding the Green Line and the MBTA express bus services operating from Riverside showed that 4% of the Green Line riders and less than 2% of the express bus riders come from households where no automobile was operated or available.

3.1.4 Method of Payment / Use by Handicapped

Table 3-4 shows the type of fare paid by survey respondents. The majority (75%) of the boarders pay a regular cash fare. About 14% of all boarders use the pre-paid pass. Handicapped riders, as measured by survey respondents using the handicapped fare, represent less than 1% of the riders on each line.

3.2 TRIP PURPOSE

Table 3-5 gives information on trip purpose. On both lines, the vast majority of the riders, about 95%, were coming from their homes. About 80% were traveling to work and about 8% were going to school. The remaining riders were going home, shopping or to a medical location.

On other parts of the MBTA, work trips usually make up a higher share of peak period boardings than the share found on the Orange and Red lines in this survey. Work trips represent 86% of the Blue Line boardings, 88% of the Quincy extension boardings and 95% of the Riverside Express Bus boardings. The exception to this generalization is at Riverside Station, where 66% of persons boarding the Green Line are on work trips.

Station of Boarding	Automobiles in Household			
	None	One	Two	Three or more
Forest Hills	18.9	51.5	22.2	7.3
Green	31.5	48.3	15.7	4.5
Egleston	37.3	47.1	14.1	1.6
Dudley	52.3	35.7	10.0	2.1
Northampton	43.6	46.3	8.0	2.1
Dover	35.8	47.5	14.8	1.9
Orange Line Surveyed*	32.5	46.3	16.6	4.6
Ashmont	21.0	51.4	19.4	8.1
Fields Corner	32.5	48.8	13.5	5.2
Andrew	36.4	41.1	17.8	4.7
Red Line Surveyed*	26.4	48.9	17.9	6.8

*Total percentages for each line are based upon survey results expanded to reflect number of boardings at each station.

Note: This information is based upon results of a survey conducted in June, 1977. Hours of the survey were 7 AM to 10 AM.

AUTO OWNERSHIP LEVELS FOR TRANSIT RIDERSHIP
(IN PERCENTAGES)

TABLE
3-3

Method of Payment	Transit Line Surveyed	
	Orange Line*	Red Line*
Student Transfer	3.6	3.4
Elderly	3.6	4.3
Handicapped	0.2	0.6
Student Half Fare	1.9	1.6
Child Half Fare	0.2	0.1
Pre-Paid Pass	14.9	13.7
Cash Fare	75.1	75.5
Other	0.4	0.9

*Total percentages for each line are based upon survey results expanded to reflect number of boardings at each station

Note: This information is based upon results of a survey conducted in June, 1977. Hours of the survey were 7 AM to 10 AM.

METHODS OF PAYMENT BY TRANSIT RIDERSHIP
(IN PERCENTAGES)

TABLE
3-4

Category of Trip Purpose	Transit Line Surveyed	
	Orange Line*	Red Line*
Work	81.4	80.6
School	7.7	8.8
Shopping	3.2	2.4
Home	2.5	2.1
Medical	1.3	1.7
Other	3.8	4.4

*Total percentages for each line are based upon survey results expanded to reflect number of boardings at each station.

Note: This information is based upon results of a survey conducted in June, 1977. Hours of the survey were 7 AM to 10 AM.

TRIP PURPOSES FOR TRANSIT RIDERS
(IN PERCENTAGES)

TABLE
3-5

3.3 ORIGINS

Figure 3-1 shows the Orange Line and Red Line in relation to Boston and nearby communities. Information on the origins of transit riders is shown in Table 3-6. Over 90% of the Orange Line riders surveyed started their trip within the City of Boston. Most of the Orange Line riders came from Roxbury (24%), Jamaica Plain (21%), West Roxbury / Roslindale (12%), Hyde Park (11%) and Dorchester (9%). Dedham was the only city or town besides Boston having a significant number of origins for Orange Line riders (4%).

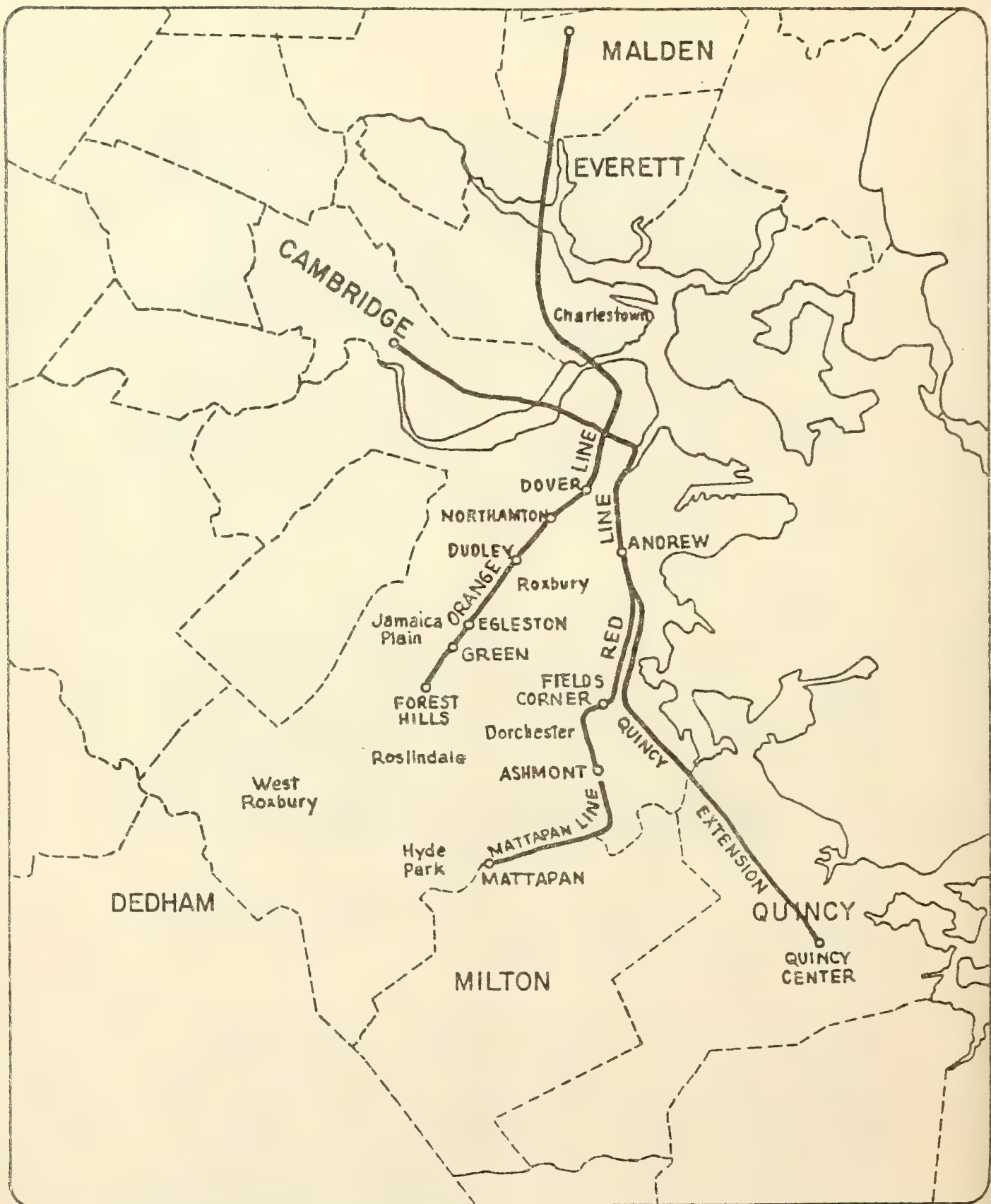
Nearly three-fourths of all Red Line riders surveyed had Boston origins. Half of the riders came from Dorchester and about 10% came from Mattapan. Milton represented 12% of the origins. The South Shore communities beyond Route 128 collectively account for about 7% of all Red Line origins.

3.4 DESTINATIONS

More than 90% of the Orange Line riders surveyed had Boston destinations. Data on destinations of Orange and Red Line riders is shown in Table 3-7. Boston Proper (that is, within Massachusetts Avenue) was the destination for eight out of ten Orange Line riders. Downtown Boston was the destination for nearly 90% of the riders going to Boston Proper. About 4% of the Orange Line riders were going to Cambridge. Although Charlestown, Everett and Malden are within easy reach of the Orange Line, only a small percentage of the riders surveyed reported these areas as destinations.

Nearly 90% of the Red Line riders surveyed had destinations in Boston. Over 70% of the Red Line riders were going to Boston Proper. About 8% of the riders had Cambridge as a destination.

Downtown Boston was the destination for 82% of the Red Line riders going to Boston Proper. Back Bay represents a much larger share of the travel bound for Boston Proper for the Red Line ridership than it does for the Orange Line ridership (15.3% vs. 6.6%). It is more time consuming for Orange Line riders to reach Back Bay destinations using the Green Line than it is for Red Line riders. Red Line riders can transfer to any branch of the Green Line at Park Street. Orange Line riders can transfer to the Green Line at Haymarket or North Station. Additional transfers may be required to reach the correct branch of the Green Line. The Orange Line rider must travel a greater distance on the Green Line than the Red Line rider to reach a specific destination. Also, some potential Orange Line riders use the Arborway Branch to reach Back Bay.



ORANGE LINE AND RED LINE IN RELATION TO BOSTON
NEIGHBORHOODS AND NEARBY COMMUNITIES

one mile



FIG.
3-1

Town or Neighborhood of Origin	Orange Line*		Transit Line Surveyed		Red Line*	
	Number of Boarders	Percent of All Boarders	Number of Boarders	Percent of All Boarders	Number of Boarders	Percent of All Boarders
Boston	11,737	90.2%	6,247	74.1%		
-Roxbury	3,168	24.3	44	0.5		
-Dorchester	1,157	8.9	4,227	50.2		
-Jamaica Plain	2,722	20.9	244	2.9		
-W. Rox. & Roslindale	1,520	11.7	16	0.2		
-Hyde Park	1,380	10.6	24	0.3		
-Mattapan	842	6.5	837	9.9		
-South Boston	0	0.0	771	9.1		
-South End	408	3.1	8	0.1		
-Other Neighborhoods	540	4.2	76	0.9		
Brookline	149	1.1	0	0.0		
Dedham	513	4.0	16	0.2		
Milton	82	0.6	1,008	12.0		
Newton	104	0.8	0	0.0		
Quincy	69	0.5	76	0.9		
Outer Southwest Towns**	183	1.4	136	1.6		
Outer South Shore Towns***	14	0.1	618	7.3		
Brockton & Vicinity****	36	0.3	299	3.5		
Remaining Origins	125	1.0	31	0.4		
Total Origins	13,012	100.0%	8,431	100.0%		

*Boardings and percentages for each line are based upon survey results expanded to reflect number of boardings at each station.

**Includes Needham, Dover, Westwood, Norwood, Canton, Stoughton, Sharon, and other towns in Southwest section of EMRPP district.

***Includes Randolph, Braintree, Weymouth, Hingham, Holbrook, Rockland, and other towns in South Shore section of EMRPP district.

****Includes Brockton and nearby towns - Abington, Hanson, Whitman, Avon, Easton, Halifax, East Bridgewater, West Bridgewater, and Bridgewater.

ORIGINS OF TRANSIT RIDERS

TABLE
3-6

Town or Neighborhood Destination	Orange Line*		Transit Line Surveyed		Red Line*	
	Number of Boarders	Percent of All Boarders	Number of Boarders	Percent of All Boarders	Number of Boarders	Percent of All Boarders
Boston	12,009	92.3	7,394	87.7		
-Boston Proper	10,469	80.5	6,045	71.7		
(Downtown)	(9,415)	(72.4)	(4,988)	(59.1)		
(South End)	(363)	(2.8)	(133)	(1.6)		
(Back Bay)	(691)	(5.3)	(924)	(11.0)		
-Fenway	241	1.8	378	4.5		
-South Boston	242	1.9	348	4.1		
-Roxbury	216	1.7	0	0.0		
-Dorchester	306	2.4	393	4.7		
-Jamaica Plain	198	1.5	14	0.2		
-Allston/Brighton	56	0.4	99	1.2		
-Charlestown	133	1.0	47	0.5		
-East Boston	68	0.5	47	0.5		
-Other Neighborhoods	80	0.6	23	0.3		
Cambridge	581	4.5	714	8.5		
Somerville	11	0.1	11	0.1		
Everett & Chelsea	51	0.4	25	0.3		
Quincy	70	0.5	93	1.1		
Newton	79	0.6	51	0.6		
Brookline	63	0.5	54	0.7		
Northern Corridor Towns**	80	0.6	11	0.1		
Remaining Towns	68	0.5	78	0.9		
Total Destinations	13,012	100.0	8,431	100.0		

*Boardings and percentages for each line are based upon survey results expanded to reflect number of boardings at each station.

**Includes Malden, Medford, Winchester, Melrose, Woburn, Stoneham and Wakefield.

TABLE
3-7

DESTINATIONS OF TRANSIT RIDERS

3.5 STATIONS OF BOARDING AND ALIGHTMENT

3.5.1 Orange Line

Information on boardings by station is shown in Table 2-1. The counts made at each station showed that 6,076 persons boarded the Orange Line at Forest Hills during the morning of the survey, which represents almost half of the Orange Line boardings (13,012). Another one-fourth of the ridership boarded at Dudley, and one-eighth, at Egleston. The combined boardings at Green, Northampton and Dover account for 18% of all boardings observed at Orange Line stations.

Table 3-8 shows information on the percentage of Orange Line boarders alighting at each station. Only 2% of the Orange Line riders traveled on the line beyond North Station. Most of the Orange Line riders left the line at either Washington or State Station. About 5,065 (40%) of the Orange Line riders alighted at Washington.

About 16% of the boardings at Northampton and Dover, the two innermost stations surveyed, were in the outbound direction. The percentage of outbound boardings at other Orange Line stations surveyed was considerably lower.

3.5.2 Red Line

Table 2-1 shows information on boardings at Red Line stations. Most of the Red Line riders surveyed--six out of every ten--boarded at Ashmont. The remaining boarders were split almost evenly between Fields Corner and Andrew Station.

Table 3-9 presents information on the percentage of Red Line boarders alighting at each station. The majority of the riders surveyed left the Red Line at either Park (40%) or Washington (25%). Over 13% left at South Station, and about 8% alighted at Red Line stations in Cambridge (Kendall, Central or Harvard).

Travel on the Red Line outbound by persons surveyed was very limited: less than 3% of the boarders at Fields Corner rode outbound, less than 2% of the Andrew boarders rode the main branch of the Red Line outbound, and about 4% of the Andrew boarders rode the Quincy Extension outbound.

Station Off	Forest Hills	Station On					Orange Line Surveyed**
		Green	Egleston	Dudley	Northampton	Dover	
Forest Hills	-	1.6*	1.9*	2.2*	7.3*	4.9*	1.5
Green	0.2	-	0.8*	0.0	2.1*	0.0	0.3
Egleston	0.4	1.6	-	0.0	2.6*	0.0	0.4
Dudley	1.6	4.4	11.5	-	3.1*	12.4*	3.2
Northampton	2.8	2.2	4.7	1.6	-	0.0	2.3
Dover	2.5	6.6	3.5	5.8	1.6	-	3.4
Essex	7.5	7.2	6.0	7.9	5.2	4.9	7.1
Washington	40.3	41.9	38.4	41.7	39.4	37.1	40.3
State	35.5	27.0	23.4	28.5	25.7	32.7	31.4
Haymarket	5.1	4.9	5.5	4.9	6.9	5.0	5.2
North Station	3.2	1.6	2.7	4.7	3.1	1.8	3.3
North of Downtown	0.9	1.0	1.6	2.6	3.6	1.2	1.6

*Reverse commuting.

**Total percentages for each line are based upon survey results expanded to reflect number of boardings at each station.

TABLE
3-8

STATIONS OF BOARDING AND ALIGHTMENT
FOR ORANGE LINE RIDERS
(IN PERCENTAGES)

<u>Station Off</u>	<u>Station On</u>			<u>Red Line Surveyed**</u>
	<u>Ashmont</u>	<u>Fields Corner</u>	<u>Andrew</u>	
Quincy	0.0	0.3*	4.1*	0.8
Ashmont	-	2.6*	0.7*	0.8
Fields Corner	1.4	-	0.0	0.9
Savin Hill	0.2	0.3	0.7*	0.3
Columbia	2.6	2.6	0.4*	2.2
Andrew	1.3	1.8	-	1.4
Broadway	2.0	7.9	4.0	3.7
South Station	14.2	12.3	13.2	13.7
Washington	27.7	26.6	29.4	27.3
Park	40.1	33.2	38.0	38.2
Charles	2.3	2.6	2.9	2.5
Cambridge	8.2	9.8	6.6	8.2

*Reverse commuting.

**Total percentages for each line are based upon survey results expanded to reflect number of boardings at each station.

STATIONS OF BOARDING AND ALIGHTMENT
FOR RED LINE RIDERS
(IN PERCENTAGES)

TABLE
3-9

3.6 STATION ACCESS AND DEPARTURE

3.6.1 Orange Line

3.6.1.1 Access

Information on the submode of access to the Orange Line stations is shown in Table 3-10. Over half of the riders arrived at the line by bus, with another one-fourth walking, and about 18% driving or being driven to their station. About 1% of all boarders used two transit vehicles (for example, transfer from one bus to another) to reach their boarding station.

While the percentages of arrivals by different submodes vary considerably from station to station, the absolute number of persons walking to the stations hardly varies. The number of persons walking to an Orange Line station ranged from 660 at Forest Hills to 400 at Green Street Station. The number of arrivals by bus to the stations varied a great deal due to different supplies of feeder service to the stations. The number of arrivals by auto varied as a result of a number of factors. Some of the factors are parking space availability, safety of the station area from crime, and location of the station in relation to the highway system.

3.6.1.2 Departure

About 73% of the Orange Line riders did not specify that a transfer was made to another mass transit line after they left the Orange Line. Presumably, these persons walked to their destinations. About 7% used a bus immediately after leaving the Orange Line. Another 3% of the riders transferred from the Orange Line to another part of the rapid transit system and then used a bus to get to their destination.

Twenty percent of the Orange Line riders used the Red, Blue or Green Line upon alightment from the Orange Line. Table 3-11 presents information on the number of transfers to other rapid transit lines. About 1,700 riders, or 13% of the riders surveyed, transfer to the Red Line. About 400 of these riders continue to the Green Line from the Red Line. Another 180 riders transfer directly to the Green Line from the Orange Line (at Haymarket or North Station). About 710 riders, or 5.5% of the riders surveyed, transfer to the Blue Line.

Station Of Boarding	Mode of Access			Trolley or Train		Taxi	Other
	Park & Ride	Kiss & Ride	Bus	Walking			
Forest Hills	63.3	15.8	8.0	1.5	0.5	0.0	0.0
Green	1.7	18.9	2.8	1.1	0.0	0.0	0.0
Egleston	50.8	9.3	1.9	1.6	1.2	0.0	0.0
Dudley	77.2	3.7	2.4	0.6	0.2	0.0	0.0
Northampton	11.6	14.8	6.3	0.0	2.1	0.0	0.0
Dover	7.3	23.6	1.8	0.6	0.0	0.0	0.0
Orange Line Surveyed*	56.2	12.6	5.2	1.1	0.5	0.0	0.0
Ashmont	36.2	6.8	5.1	29.6**	0.3	0.1	0.1
Fields Corner	40.9	3.3	1.8	1.3	0.5	0.0	0.0
Andrew	50.2	10.5	6.9	2.2	0.0	0.4	0.4
Red Line Surveyed*	39.9	6.8	4.8	18.2	0.3	0.1	0.1

*Total percentages for each line are based upon survey results expanded to reflect number of boardings at each station.

**Includes riders using both bus and trolley to reach Ashmont.

TABLE
3-10

MODE OF ACCESS TO TRANSIT STATION
(IN PERCENTAGES)

<u>Line Departed</u>	<u>Station Name</u>	<u>Number of Departures</u>	<u>Number of Transfers</u>	<u>Line Transferred to</u>
ORANGE	Washington	5,240	1,700*	Red
ORANGE	State	4,080	710	Blue
ORANGE	Haymarket	690	170	Green
ORANGE	No. Station	430	10	Green
RED	Washington	2,300	620	Orange
RED	Park	3,220	1,760	Green

*About 400 of these riders continue to the Green Line from the Red Line.

Note: This information is based upon results of a survey conducted in June 1977. Hours of the survey were 7:00 to 10:00 a.m.

DEPARTURES AND TRANSFERS AT SELECTED STATIONS
(FOR RIDERS BOARDING AT STATIONS SURVEYED)

TABLE
3-11

3.6.2 Red Line

3.6.2.1 Access

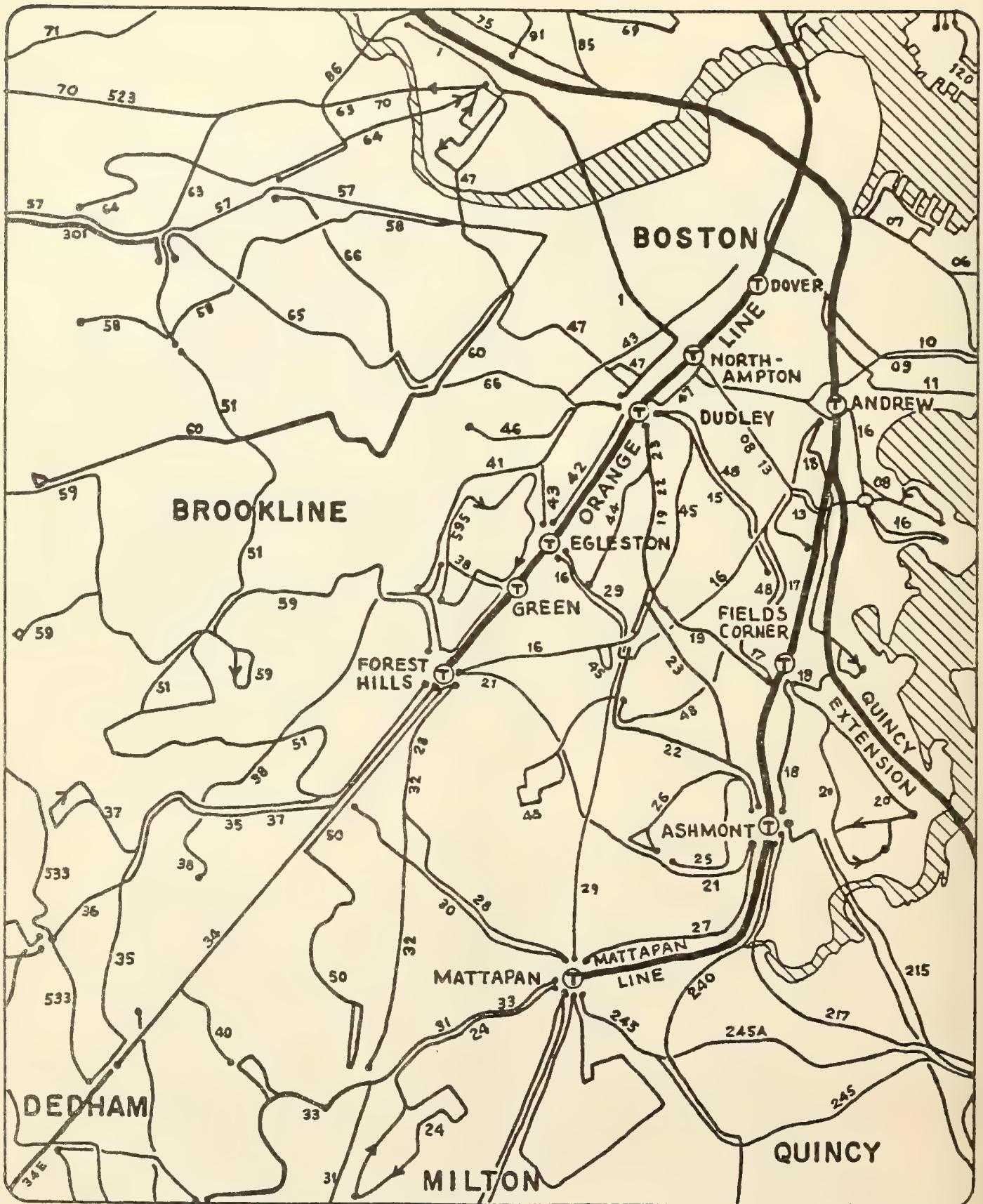
Information on the sub-mode of access to the Red Line stations is shown in Table 3-10. Percentage arrival by the different sub-modes varies considerably from station to station. Trolley is only an option at Ashmont. At Ashmont, 22% of the riders walked to the station, 36% used bus only, 22% used the Mattapan High Speed Line only, and 8% used both a bus and the Mattapan Line. Over half of the riders boarding at Fields Corner walked to the station. Forty percent of the Fields Corner boarders used bus to reach the station. At Andrew, 30% of the boarders walked to the station, 50% took a bus, and 17% drove or were driven to the station.

3.6.2.2 Departures

Sixty-two percent of the Red Line riders did not specify that a transfer was made. They presumably walked. Eight percent left the Red Line by bus, with another 1% transferring from the Red Line to another rapid transit line and then to a bus. Twenty-nine percent of the Red Line riders surveyed transferred to another part of the rapid transit system after leaving the Red Line. This breaks down as follows: About 620 riders (7.4% of the Red Line riders surveyed) transfer to the Orange Line, and about 1,760 riders (21.9% of the riders surveyed) transfer to the Green Line. A few of these riders (about 105) continue to the Blue Line from the Orange or Green lines.

3.7 MAJOR TRANSIT ROUTES OF ACCESS

Figure 3-2 shows the feeder bus network for the Orange Line and Red Line. Tables 3-12 and 3-13, respectively, give information on the number of persons arriving at the Orange Line and Red Line stations surveyed by individual bus routes. This data is useful to determine how many riders arrive at the station by one route relative to another route. The data is of limited value as a source of bus ridership data for two reasons. First, the data has been expanded from survey responses (procedure for expansion described in Section 2.4). Second, the bus riders using the bus routes and not boarding the rapid transit system are not represented in Tables 3-12 and 3-13. Peak load counts, characteristic counts and surveys conducted for individual bus routes are better sources of bus ridership data.



FEEDER BUS NETWORK TO THE ORANGE LINE AND RED LINE

one mile



FIG.
3-2

Bus Routes Serving Orange Line

<u>Number</u>	<u>Name of Bus Route</u>	<u>Arrivals by Bus at Station</u>
1	Harvard-Dudley	64
15	Kane Sq.-Dudley	329
21	Ashmont-Forest Hills	71
22	Ashmont-Dudley via Talbot	442
23	Ashmont-Dudley via Washington	493
28	Mattapan-Arborway	138
29	Mattapan-Egleston	781
31	Wolcott Sq.-Mattapan	58
32	Cleary Sq.-Arborway via Hyde Park	495
34	Dedham Line-Arborway	974
35	Stimson-Arborway	163
36	Charles River-Arborway	547
37	Vermont-Arborway	170
38	Wren St.-Green	223
40	Georgetown-Arborway	125
41	Centre&Eliot-Dudley	205
42	Egleston-Dudley	134
44	Seaver St.-Dudley	547
45	Franklin Park-Dudley	376
50	Cleary Sq.-Arborway via Washington	151
51	Cleveland Circle-Arborway	270
59	Chestnut Hill-Forest Hills	70
66	Allston-Dudley	157
	Remaining Bus Routes*	284

Total arriving at Orange Line by Bus 7,267

Arrival at Orange Line by Arborway Line 70

*Arrivals at the stations for all bus routes carrying less than 50 persons to the station during the morning peak period are shown here.

Note: This information is based upon results of a survey conducted in June, 1977. Hours of the survey were 7 AM to 10 AM.

ARRIVALS TO ORANGE LINE STATIONS
BY INDIVIDUAL BUS ROUTES

TABLE
3-12

Bus Routes Serving Red Line

<u>Number</u>	<u>Name of Bus Route</u>	<u>Arrivals by Bus at Station</u>
10	City Point-Dudley	82
16	Egleston-Andrew	148
17	Fields Corner-Andrew	552
18	Ashmont-Andrew	119
20	Fields Corner-Neponset	465
21	Ashmont-Forest Hills	142
22	Ashmont-Dudley via Talbot	122
23	Ashmont-Dudley via Washington	97
24	Wakefield Ave-Mattapan	63
25	Gallivan-Ashmont	125
26	Norfolk-Ashmont	163
27	Mattapan-Ashmont	163
33	Dedham Line-Mattapan	65
215	Quincy Center-Ashmont	102
217	Ashmont-Wollaston	58
240	Avon-Ashmont	451
	Remaining Bus Routes*	263

Total arriving at Red Line by bus 3,180

Persons arriving at Red Line by Mattapan line only 1,196

Persons arriving at Red Line by Bus and Mattapan Line 393

*Arrivals at the stations for all bus routes carrying less than 50 persons to the station during the morning peak period are shown here

**Persons using only bus to reach the Red Line and persons using a combination of bus and Mattapan Line are included in this estimate.

Note: This information is based upon results of a survey conducted in June, 1977. Hours of the survey were 7 AM to 10 AM.

ARRIVALS TO RED LINE STATIONS
BY INDIVIDUAL BUS ROUTES

TABLE
3-13

The routes carrying the largest number of Orange Line riders to their station are (in descending order): Route 34, Dedham Line - Arborway; Route 29, Mattapan - Egleston; Route 36, Charles River - Arborway; Route 44, Seaver St. - Dudley; Route 32, Cleary Sq. - Arborway; and Route 23, Ashmont - Dudley via Washington. Each of these routes carries over 400 riders to the Orange Line in the morning peak period. The routes carrying the largest number of Red Line boarders are (in descending order): the Mattapan - Ashmont High Speed Line; Route 17, Fields Corner - Andrew; Route 20, Fields Corner - Neponset; and Route 240, Avon - Ashmont. About 1,500 Red Line riders use the high speed line to reach the Red Line in the morning peak period. Each of the bus routes named carries more than 300 persons to the Red Line in the morning peak period.

3.8 COMMENTS ON SERVICE

3.8.1 Rapid Transit Service

Orange and Red Line riders participating in the survey were requested to comment on transit service. About 40% of the riders responding to the survey made comments about the rapid transit or streetcar service. Table 3-14 presents information on responses pertaining to different transit lines. (Where no line was specifically mentioned, the respondent's comment was assumed to refer to all lines used to complete the trip.) The Orange Line accounted for 57% of all comments, the Red Line, 38%, and the Green Line, 8%. Two-thirds of the Green Line comments pertained to the Arborway Branch.

Conditions stemming from a shortage of trains (long waits, overcrowding, etc.) were most frequently cited for all lines. Train condition (frequent breakdowns, dirty trains, decrepit trains, etc.), station condition (poor lighting, dirty and decrepit stations), and poor winter service followed as frequently mentioned categories of comments. Slow operating speed was primarily a concern for users of the Green Line. Only 6% of the Orange and Red Line users and none of the users of the Green Line commented that they were satisfied with the transit service.

It must be noted that the comments reflect the views of peak period transit users. Certain items, such as inadequate crosstown service and lack of security, would be of greater concern to off-peak users than they were to peak period users.

<u>Category of Comment</u>	<u>Percent of Occurrence</u>		
	<u>Orange</u>	<u>Red</u>	<u>Green</u>
Not enough trains (long waits, overcrowding)	27	42	81
Train in poor condition (frequent breakdowns, decrepit)	15	20	37
Poor station condition (poor lighting, dirty, decrepit)	15	8	4
Poor winter service	10	10	18
Poor climate control (hot in summer, cold in winter)	8	10	13
Poor service weekends & evenings	7	7	14
More express trains	10	4	1
Trains not stopping	8	7	0
Operating speed too slow	5	7	23
Lack of information (delays not explained, schedules not posted)	5	8	0
Smoking on trains	6	4	0
Good service	6	6	0
Lack of security	5	4	0
Poor employee attitudes	3	4	6
Poor track conditions (elevated unsafe, signal failures)	6	1	4
Fares (too high, no free transfer)	4	5	1
No crosstown service (too many transfers needed)	2	1	0
Operating speed too fast	1	1	0
Limited parking at station	2	1	0
Other	3	2	0

COMMENTS ABOUT RAPID TRANSIT AND STREETCAR SERVICE

TABLE
3-14

3.8.2 Bus Service

About 10% of the riders responding to the survey made comments that pertained to the MBTA bus service.

These comments fall into the following categories:

Poor schedule adherence - mentioned in 42% of the comments on bus service.

Inadequate service frequency - mentioned in 34% of the comments on bus service.

Poor driver attitude - mentioned in 14% of the comments on bus service.

Smoking on the bus - mentioned in 10% of the comments on bus service.

Dirty buses - mentioned in 9% of the comments on bus service.

Slow service - mentioned in 8% of the comments on bus service.

Other items (location of bus stops, crime, etc.) - mentioned in 7% of the comments on bus service.

Bus routes 29 (Mattapan - Egleston via Blue Hill Avenue) and 44 (Seaver St. - Dudley via Humboldt) had a high number of complaints about schedule compliance.

Routes 22 (Ashmont - Dudley via Talbot), 23 (Ashmont - Dudley via Washington), and 45 (Franklin Park - Dudley via Blue Hill Avenue) were overcrowded. All five of these routes had complaints about driver attitude.

Many riders complained that bus drivers refused to stop or did not allow sufficient time for passengers to be seated before proceeding. Some riders commented that the night schedule was not carefully followed. The respondents expressed a need for more weekend service.

4.0 HISTORICAL TRENDS

This section will discuss the 1977 survey results in the context of trends in transit ridership since the 1960's. In the first subsection, the CTPS/EOTC Transit Marketing Study findings about changes in boarding levels at the nine transit stations surveyed are summarized. In the second and third subsections, the results of the 1963 Transit Postcard Survey will be compared with the results of the 1977 survey to identify any changes in the patterns of origins and destinations by morning peak period boarders at the nine stations.

4.1 HISTORICAL TRENDS IN BOARDINGS

4.1.1 Orange Line

During the period from 1967 to 1970, according to the CTPS/EOTC Transit Marketing Study, there were declines in boardings at Forest Hills, Green, Dudley, Northampton and Dover in excess of the MBTA rapid transit system-wide decline of 2.2%. Boardings at Egleston in 1970 were slightly higher than 1967 levels.

Between 1970 and 1975, boardings declined at all six Orange Line stations in the survey. Boardings at Green and Northampton fell at a lesser rate than the system-wide decline of 11%. Boardings at Forest Hills, Egleston, Dudley and Dover fell by 20% to 26% over that period.

Over the 1975 to 1976 period, boardings at Dover increased. The declines at Northampton and Egleston were somewhat greater than the overall rapid transit system-wide decline of 2.3%. The losses in boardings at Forest Hills, Green and Dudley were the largest - between 5.5 and 12.5 over this one year period.

4.1.2 Red Line

During the period from 1967 to 1970, according to the CTPS/EOTC Transit Marketing Study, declines in boardings at Fields Corner (6.2%) exceeded overall declines in MBTA rapid transit ridership, which were 2.2%. Boardings at Ashmont and Andrew in 1970 were slightly higher than 1967 levels.

Between 1970 and 1975, boardings declined at all three Red Line stations in the survey. Boardings at Andrew fell by 24% over that period. The decline for Fields Corner and Andrew was even more severe, but that decline can be explained as

being the result of the opening of the Quincy Extension in 1971. Many transit riders who boarded at Fields Corner and Ashmont diverted to Quincy Extension stations, when they were given that option.

Over the 1975 to 1976 period, boardings at Andrew and Fields Corner fell but not so sharply as the system-wide decline of 2.3%. The decline at Ashmont was 4.3%, which is somewhat greater than the overall decline.

4.2 TRENDS IN ORIGIN PATTERNS

4.2.1 Orange Line

Information on origins for 1963 and 1977 boarders at the six Orange Line stations between 7 A.M. and 10 A.M. is presented in Table 4-1. (Figure 3-1 shows the location of communities in relation to the Orange Line.) Since 1963, boardings have declined by 32%, from 19,250 to 13,000. Losses in boarders from West Roxbury, Roslindale and the outer Southwest communities exceed this overall rate of decline. The decline rate for boarders from Roxbury and Dorchester matches the overall rate of decline. The number of boarders coming from Jamaica Plain, Hyde Park and Dedham has remained stable. The number of boarders from Mattapan has increased since 1963.

4.2.2 Red Line

Table 4-2 compares 1963 and 1977 morning peak period origins for boarders at the three Red Line stations. Since 1963, boardings have declined by over 50 percent, from 17,200 to 8,400. Losses in boarders from Quincy greatly exceeded the overall rate of decline. The share of boarders coming from Boston in 1977 has risen from the 1963 level. These facts reflect a diversion of Quincy riders to the South Shore Extension, which opened in 1971. Boardings from Milton fell at a rate that matched the overall rate of decline. There were more boardings from Jamaica Plain and South Boston in 1977 than there were in 1963.

4.3 DESTINATIONS

4.3.1 Orange Line

Table 4-3 compares 1963 and 1977 morning peak period destinations for Orange Line boarders. The share of riders having Boston Proper as a destination has increased slightly. The number of persons using the Orange Line to reach the Back Bay has increased, which reflects (1) the deterioration of the alternative to the Orange Line, Arborway Branch service and

<u>Origins</u>	<u>1963 Boarders</u>	<u>Percent of all Boarders</u>	<u>1977 Boarders</u>	<u>Percent of all Boarders</u>
Boston	16,863	87.6	11,737	90.2
Roxbury	4,439	23.1	3,168	24.3
Dorchester	1,701	8.8	1,157	8.9
Jamaica Plain	2,761	14.3	2,722	20.9
W. Rox. & Roslindale	4,541	23.6	1,520	11.7
Hyde Park	1,322	6.9	1,380	10.6
Mattapan	520	2.7	842	6.5
South Boston	36	0.2	0	0.0
South End	1,020	5.3	408	3.1
Other neighborhoods	523	2.7	540	4.2
Brookline	213	1.1	149	1.1
Dedham	533	2.8	513	4.0
Milton	38	0.2	82	0.6
Newton	64	0.3	104	0.8
Quincy	79	0.4	69	0.5
Outer Southwest towns*	1,007	5.2	183	1.4
Outer South Shore towns**	154	0.8	14	0.1
Brockton & vicinity***	60	0.3	36	0.3
Remaining origins	239	1.3	125	1.0
 TOTAL ORIGINS	 19,250	 100.0	 13,012	 100.0

*Includes Needham, Dover, Westwood, Norwood, Canton, Stoughton, Sharon and other towns in Southwest section of EMRPP district.

**Includes Randolph, Braintree, Weymouth, Hingham, Holbrook, Rockland and other towns in South Shore section of EMRPP district.

***Includes Brockton and nearby towns--Abington, Hanson, Whitman, Avon, Easton, Halifax, East Bridgewater, West Bridgewater and Bridgewater.

COMPARISON OF 1963 POSTCARD SURVEY AND
1977 REPLACEMENT/TRANSIT SURVEY
ORIGINS OF BOARDERS AT ORANGE LINE STATIONS (7 - 10 am)

TABLE
4-1

<u>Origins</u>	<u>1963 Boarders</u>	<u>Percent of all Boarders</u>	<u>1977 Boarders</u>	<u>Percent of all Boarders</u>
Boston	10,394	60.4	6,247	74.1
Roxbury	353	2.1	44	0.5
Dorchester	7,727	44.9	4,227	50.2
Jamaica Plain	21	0.1	244	2.9
W. Rox. & Roslindale	35	0.2	16	0.2
Hyde Park	489	2.8	24	0.3
Mattapan	1,072	6.2	837	9.9
South Boston	578	3.4	771	9.1
South End	0	0.0	8	0.1
Other neighborhoods	119	0.7	76	0.9
Brookline	1	0.0	0	0.0
Dedham	3	0.0	16	0.2
Milton	1,984	11.6	1,008	12.0
Newton	14	0.1	0	0.0
Quincy	2,456	14.3	76	0.9
Outer Southwest towns*	276	1.6	136	1.6
Outer South Shore towns**	1,658	9.6	618	7.3
Brockton & vicinity***	356	2.1	299	3.5
Remaining origins	52	0.3	31	0.4
 TOTAL ORIGINS	 17,194	 100.0	 8,431	 100.0

*Includes Needham, Dover, Westwood, Norwood, Canton, Stoughton, Sharon and other towns in Southwest section of EMRPP district.

**Includes Randolph, Braintree, Weymouth, Hingham, Holbrook, Rockland and other towns in South Shore section of EMRPP district.

***Includes Brockton and nearby towns--Abington, Hanson, Whitman, Avon, Easton, Halifax, East Bridgewater, West Bridgewater and Bridgewater.

COMPARISON OF 1963 POSTCARD SURVEY AND
1977 REPLACEMENT/TRANSIT SURVEY
ORIGINS OF BOARDERS AT RED LINE STATIONS (7 - 10 AM)

TABLE
4-2

<u>Destinations</u>	<u>1963 Boarders</u>	<u>Percent of all Boarders</u>	<u>1977 Boarders</u>	<u>Percent of all Boarders</u>
Boston	17,465	90.7	12,009	92.3
Boston Proper	15,230	79.1	10,469	80.5
(Downtown)	(14,041)	(72.9)	(9,415)	(72.4)
(South End)	(578)	(3.0)	(363)	(2.8)
(Back Bay)	(611)	(3.2)	(691)	(5.3)
Fenway	436	2.3	241	1.8
South Boston	503	2.6	242	1.9
Roxbury	322	1.7	216	1.7
Dorchester	155	0.8	306	2.4
Jamaica Plain	62	0.3	198	1.5
Allston/Brighton	128	0.7	56	0.4
Charlestown	414	2.1	133	1.0
East Boston	84	0.4	68	0.5
Other neighborhoods	131	0.7	80	0.6
Cambridge	903	4.7	581	4.5
Somerville	111	0.6	11	0.1
Everett & Chelsea	167	0.9	51	0.4
Quincy	0	0.0	70	0.5
Newton	56	0.3	79	0.6
Brookline	68	0.3	63	0.5
Northern Corridor towns*	159	0.8	80	0.6
Remaining towns	321	1.7	68	0.5
	<hr/> 19,250	<hr/> 100.0	<hr/> 13,012	<hr/> 100.0

*Includes Malden, Medford, Winchester, Melrose, Woburn, Stoneham and Wakefield.

COMPARISON OF 1963 POSTCARD SURVEY AND
1977 REPLACEMENT/TRANSIT SURVEY
DESTINATIONS OF BOARDERS AT ORANGE LINE STATIONS (7 - 10 AM)

TABLE
4-3

(2) the growth in employment and retail activity in the Back Bay. The number of persons boarding at the Orange Line stations with destinations in towns in the northern corridor, has not increased in spite of the improved service stemming from the relocation of the northern terminus of the Orange Line to Oak Grove. The number of riders going to Jamaica Plain and Dorchester increased between 1963 and 1977.

4.3.2 Red Line

Table 4-4 presents information on destinations for boarders at the three Red Line stations for 1963 and 1977. The percentage of boarders with Downtown Boston as a destination fell by almost ten points between 1963 and 1977. The percentage of boarders going to the Back Bay or to Cambridge increased but the absolute number of persons going to these destinations fell over this time period. The number of persons going to Dorchester increased over this period.

<u>Destinations</u>	<u>1963 Boarders</u>	<u>Percent of all Boarders</u>	<u>1977 Boarders</u>	<u>Percent of all Boarders</u>
Boston	15,655	91.1	7,394	87.7
Boston Proper	13,286	77.3	6,045	71.7
(Downtown)	(11,801)	(68.7)	(4,988)	(59.1)
(South End)	(194)	(1.1)	(133)	(1.6)
(Back Bay)	(1,291)	(7.5)	(924)	(11.0)
Fenway	858	5.0	378	4.5
South Boston	647	3.8	348	4.1
Roxbury	109	0.6	0	0.0
Dorchester	272	1.6	393	4.7
Jamaica Plain	19	0.1	14	0.2
Allston/Brighton	245	1.4	99	1.2
Charlestown	137	0.8	47	0.5
East Boston	33	0.2	47	0.5
Other neighborhoods	49	0.3	23	0.3
Cambridge	1,075	6.2	714	8.5
Somerville	39	0.2	11	0.1
Everett & Chelsea	56	0.3	25	0.3
Quincy	28	0.2	93	1.1
Newton	28	0.2	51	0.6
Brookline	74	0.4	54	0.7
Northern Corridor towns*	74	0.4	11	0.1
Remaining towns	165	1.0	78	0.9
 TOTAL DESTINATIONS	 17,194	 100.0	 8,431	 100.0

*Includes Malden, Medford, Winchester, Melrose, Woburn, Stoneham and Wakefield.

COMPARISON OF 1963 POSTCARD SURVEY AND
1977 REPLACEMENT/TRANSIT SURVEY
DESTINATIONS OF BOARDERS AT RED LINE STATIONS (7 - 10 AM)

TABLE
4-4

REPLACEMENT/TRANSIT IMPROVEMENT STUDY
SURVEY OF MBTA ORANGE AND RED LINE RIDERS

Dear Patron:

This survey is being conducted for the MBTA in order to plan for improved transit service in the South End/Roxbury/Dorchester/Mattapan area. Your cooperation in completing and returning this questionnaire will provide important information for that planning. PLEASE DROP THE COMPLETED QUESTIONNAIRE IN THE COLLECTION BOX IN THIS STATION, IN THE COLLECTION BOX AT THE STATION WHERE YOU GET OFF THIS TRAIN, OR IN ANY MAILBOX. THE FORM IS PREPAID AND NEEDS NO POSTAGE. This information will be kept in strictest confidence, and your cooperation is greatly appreciated. Thank you.

7-1 ☐ My Home -2 ☐ School -3 ☐ Place of Work -4 ☐ Shopping -5 ☐ Medical Location -6 ☐ Other

THE PLACE I AM COMING FROM IS LOCATED AT:

8 [] [] [] [] 12 [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] 32 [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] []

Number Street or Building Name City or Town

46-1 ☐ By walking -4 ☐ As a passenger in a car that was parked -7 ☐ By taxi
-2 ☐ By bus -5 ☐ As a passenger in a car that was NOT parked -8 ☐ By other means
-3 ☐ By driving a car and parking -6 ☐ By trolley or train

TO GET TO THE TRANSIT STATION:

1st vehicle _____ 47 2nd vehicle _____ 50

53-1 ☐ Student transfer -3 ☐ Handicapped half-fare -5 ☐ Child half-fare -7 ☐ Regular cash fare
-2 ☐ Elderly half-fare -4 ☐ Student half-fare -6 ☐ Pre-paid pass -8 ☐ Other _____

54

ARE GOING, LIST, IN ORDER OF BOARDING, THE NAMES OR ROUTE NUMBERS.

1st vehicle _____ 56 2nd vehicle _____ 59

7-1 ☐ My Home -2 ☐ School -3 ☐ Place of Work -4 ☐ Shopping -5 ☐ Medical Location -6 ☐ Other

THE PLACE I AM GOING TO IS LOCATED AT:

8 12 32

Number Street or Building Name City or Town

46-01 ☐ Shop/factory worker -04 ☐ Housewife -07 ☐ Student -10 ☐ Domestic or service worker
-02 ☐ Craftsman or foreman -05 ☐ Unemployed -08 ☐ Retired -11 ☐ Other _____
-03 ☐ Clerical -06 ☐ Professional -09 ☐ Sales

48-1 ☐ 17 or under -2 ☐ 18-24 -3 ☐ 25-44 -4 ☐ 45-59 -5 ☐ 60-64 -6 ☐ 65 or over

49-1 ☐ None -2 ☐ One -3 ☐ Two -4 ☐ Three or more

M. DO YOU HAVE ANY COMMENTS OR SUGGESTIONS REGARDING YOUR TRANSIT SERVICE?

APPENDIX C: TRANSIT RIDERSHIP MODEL

TABLE OF CONTENTS

	<u>Page</u>
General Procedure	C.2
Trip End Generation	C.2
Trip Distribution	C.4
Mode Split	C.5
Trip Assignment	C.7

GENERAL PROCEDURE

Transit demand was estimated in the Replacement/Transit Improvement Study by using a series of aggregate sequential deterministic models. These models are computerized in the UTPS (UMTA Transportation Planning System) program package.

The models are aggregate models because they are intended to predict group behavior within specified zones rather than the behavior of individual trip makers. For these purposes the EMRPP (Eastern Massachusetts Regional Planning Project) region has been divided into 592 zones including 73 zones in the study area.

The models are sequential models in the sense that their structure generally follows the sequential decision making process of trip makers as opposed to simultaneous decision-making. As shown in Figure C.1, the trip end generation model deals with the first decision, e.g. to make a trip or not, followed by the trip distribution model regarding where to go. Next, the mode split model handles the choice decision between auto and transit. Finally, the trip assignment model deals with the choice among competing transit services. These models are described in detail in the sections which follow.

TRIP END GENERATION

For modeling purposes a trip is classified as either a home-based trip or a non-home-based trip. A home-based trip has either its origin or destination at the residence zone of the trip maker. A non-home-based trip, on the other hand, has neither origin nor destination at home. For example, if a person makes a trip from home to work in the morning and drops by a shopping center on his way home in the evening, the trips are classified as follows:

1. Home to work: home-based work
2. Work to shopping: non-home-based shopping
3. Shopping to home: home-based shopping

Home-based trips are assumed to be produced at home and attracted to the place of activity such as work place, shopping place, etc. When a person makes a trip from home to work in the morning and another trip from work to home in the evening, two trips are assumed to be produced at the residence zone and attracted to the zone of work place (or two trip productions at the residence zone and two trip attractions at the zone of work place). Non-home-based trips, however, are assumed to be produced at the origin of the trips and attracted to the destination of the trips.

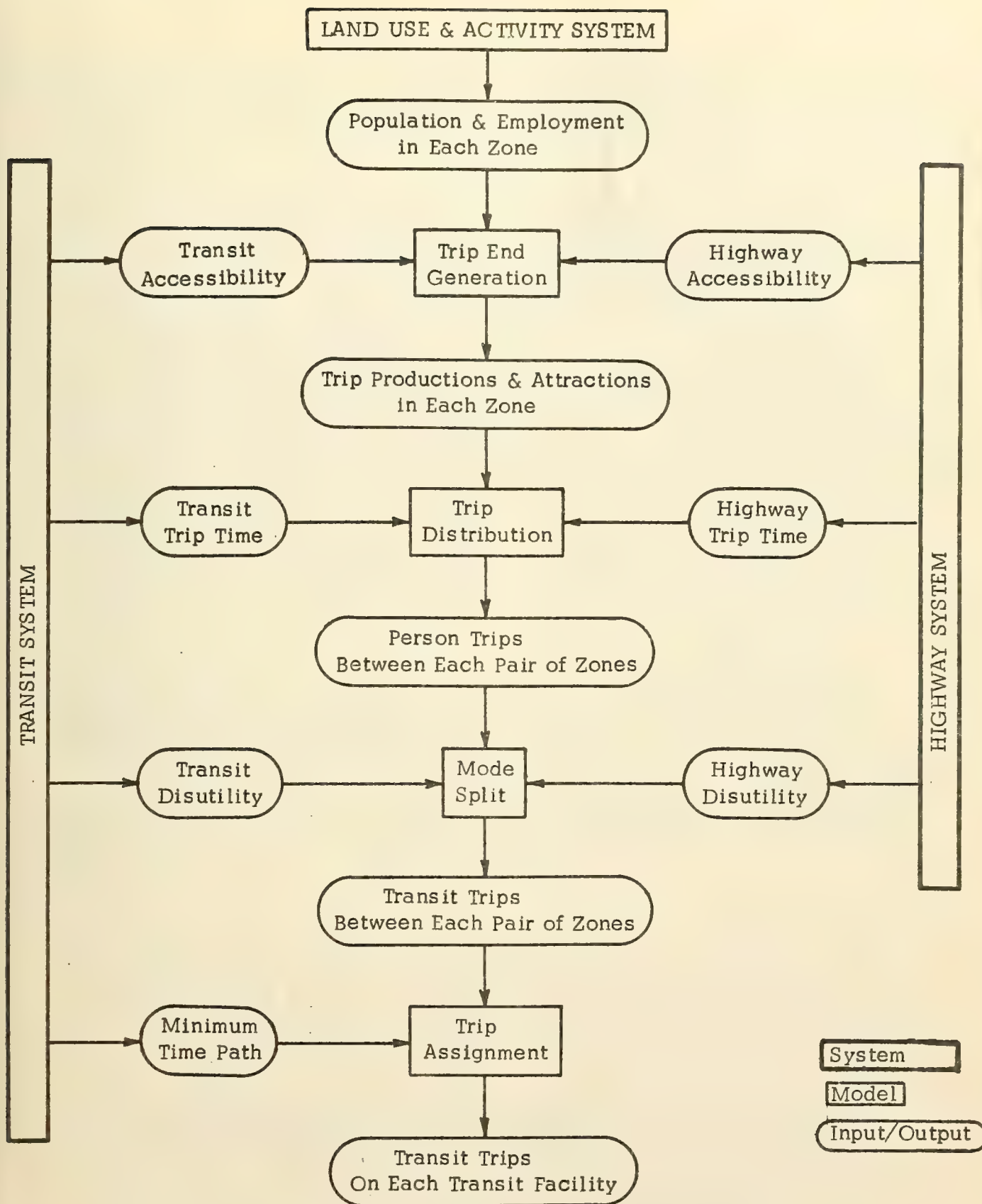


FIGURE C.1
FLOW CHART FOR DEMAND ESTIMATION

Therefore, the trip generation model estimates the number of trips produced and attracted in each zone rather than the number of trips originated and destined in each zone. The trip categories used in the estimation process are the following:

1. Home-based work trips
2. Home-based school trips
3. Home-based personal business trips
4. Home-based social/recreational trips
5. Non-home-based trips

For each trip category, both the trip productions and the trip attractions are estimated in each zone by a set of regression equations. The regression equations represent the relationship between the number of trips generated in a zone and the characteristics of the zone in terms of population and employment. They are basically trip rates: trips per person or trips per car in the case of trip productions and trips per employee (including visitors and customer trips) in the case of trip attractions.

Different equations are used for different types of areas. The EMRPP region is classified into four area types based on its accessibility. They are as follows:

1. Boston CBD
2. Urban area
3. Suburban area
4. Rural area

A total of 40 equations are required for these purposes: one equation for each of five trip categories by each of four area types by each of two trip end types (production or attraction). The regression coefficients or trip rates were obtained from the 1963 comprehensive travel survey performed as part of the EMRPP.

TRIP DISTRIBUTION

The trip distribution model determines the number of trips between a pair of zones given the number of trip ends in each zone (trip productions of a zone and trip attractions of another zone). Mathematically the model determines the number of trips of each cell of the matrix given the row totals and column totals of the matrix.

Two distinctly different models are used in the study. The first one is the gravity model that is used to develop the 1975 trip table and the other one is the Fratar model that is utilized to develop the 1985 trip table.

The gravity model assumes that the number of trips between a pair of zones is directly proportional to the number of trip ends of each zone and

inversely proportional to the travel time between the zones (more accurately to a certain function of the travel time between the zones). Socio-economic adjustment factors for certain trip interchanges are also used to adjust numbers of trips.

The travel time between a pair of zones is a weighted average of the travel time by transit and the travel time by automobile computed on the minimum time paths of the respective network. The function of the travel times and the interzonal socio-economic adjustment factors were calibrated on 1963 travel survey data and are assumed to be stable over time.

The Fratar procedure, on the other hand, does not take into account the effect of travel time changes. The future number of trips between a pair of zones is assumed to be proportional to the current number of trips between the pair of zones and to the change in the number of trip ends in each of two zones between the present and the future years, modified by the change in the number of trip ends for the remaining zones.

The required input to the Fratar model, therefore, are the current and future numbers of trip ends in each zone and the current number of trips between each pair of zones. The model computes zonal growth factors by dividing the future number of trip ends by the present number of trip ends, and then modifies the present trip table according to the growth factors.

Regardless of which method is used, the trip distribution is carried out for each of five different trip categories. The end results are five future trip tables representing 24-hour person trips (from production zone to attraction zone) during an average weekday.

At this point, the home-based personal business trips and the home-based social/recreational trips are combined into one trip table, designated as the home-based other trips, and the trip tables at the 592-zone level are converted to those of a 170-district level.

MODE SPLIT

For each pair of zones, the mode split model estimates the number of trips made by transit and automobile, given the number of person trips between the zones. Again, the trips are not the trips from origin to destination zones but the trips from production to attraction zones.

The mode split model is based on the utility theory in which an individual is assumed to assess the utility associated with each alternative available to him and to make a choice decision based on the utility. The higher the value of its utility, the more likely it will be selected.

Transit trips as a percent of total trips for a pair of production-attraction zones are a function of disutility (the inverse of utility) difference between automobile and transit, length of the trip between the zones, and level of auto ownership at the production zone (for home-based trips) or percent transit of home-based trips at the attraction zone (for non-home-based trips).

Disutility is expressed in cents. It includes out-of-pocket cost such as transit fare, parking fee, etc., and perceived trip time converted to monetary value. These are based on the minimum time path (to be discussed later) between a pair of zones during the morning peak period.

Disutility associated with automobile trips consists of the following costs expressed in 1963 dollars:

- a. Automobile operating cost - average out-of-pocket auto operating cost (3.107¢/mile).
- b. Parking cost (cents)
- c. In-vehicle time - time spent in vehicle excluding terminal time (4.17¢/min.)
- d. Terminal time - time spent to get to the parked car at the production zone, and time spent looking for a place to park and to get to the destination after parking. Terminal time is perceived to have 2.5 times as much disutility as actual time ($2.5 \times 4.17\text{¢}/\text{min.}$)

Disutility associated with transit trips consists of the following costs again expressed in 1963 dollars:

- a. Transit fare - transit fare for the minimum time path between zones (cents)
- b. Automobile operating cost - if automobiles are used for the access to transit stations or bus stops (3.107¢/mile).
- c. In-vehicle time - time spent in transit vehicle(s) plus in automobile if automobile is used for the access to transit stations or bus stops (4.17¢/min.).
- d. Out-of-vehicle time - includes walk time; wait time which is assumed to be one half of the effective headway (with a minimum of 2 minutes and a maximum of 15 minutes) and auto access penalty time of 10 minutes reflecting disutility of committing and tying up a vehicle, e.g., precluding it from use by other family members. Out-of-vehicle time like automobile terminal time is assumed to be perceived as 2.5 times the actual time ($2.5 \times 4.17\text{¢}/\text{min.}$).

The disutility difference is transit disutility minus highway disutility.

As described previously, other contributing factors for the determination of mode split are trip length and auto ownership for home-based trips. The trip length is expressed in terms of highway disutility for the production-attraction zones and auto ownership level is measured as the average number of automobiles per person at the production zone.

The mode split curves for each of four trip categories (home-based work, home-based school, home-based other, and non-home-based trips) were recently developed based on 1963 travel survey data by Alan M. Vorhees and Associates for the Massachusetts Department of Public Works. Sample mode split curves are shown in Figure C.2.

The mode split model computes the disutility for transit and automobile for each pair of production-attraction zones, estimates transit trips as a percent of total person trips, and determines the number of transit trips between the production-attraction zones. The resulting transit trip tables are combined into a single trip table representing the average weekday 24-hour transit trips from production zone to attraction zone.

TRIP ASSIGNMENT

Trip assignment is the last step in the transit demand estimation procedure. Transit trips between each pair of zones are assigned to a specific transit service or a combination of services which require the shortest time between the zones (the shortest time path or minimum time path). The assigned transit trips are then accumulated for each transit facility.

The model first finds the minimum time path for each pair of production-attraction zones in the computer-processible simulated transit network. The trip time is computed as follows:

- a. Walk time - Walking speed is assumed to be 2.5 miles per hour with a maximum walking distance of 0.5 mile.
- b. Auto access time - The time as computed in the highway network plus a penalty time of 10 minutes.
- c. Wait time - One half of the effective headway to a minimum of two minutes and a maximum of 15 minutes plus six minutes to discourage transfers. The maximum number of transfers for any one trip is four.
- d. In-vehicle time - The time spent in vehicle.

The model then assigns all transit trips between the zones to the minimum time path on a single transit service. The assignment is not constrained by the capacity of the transit facilities.

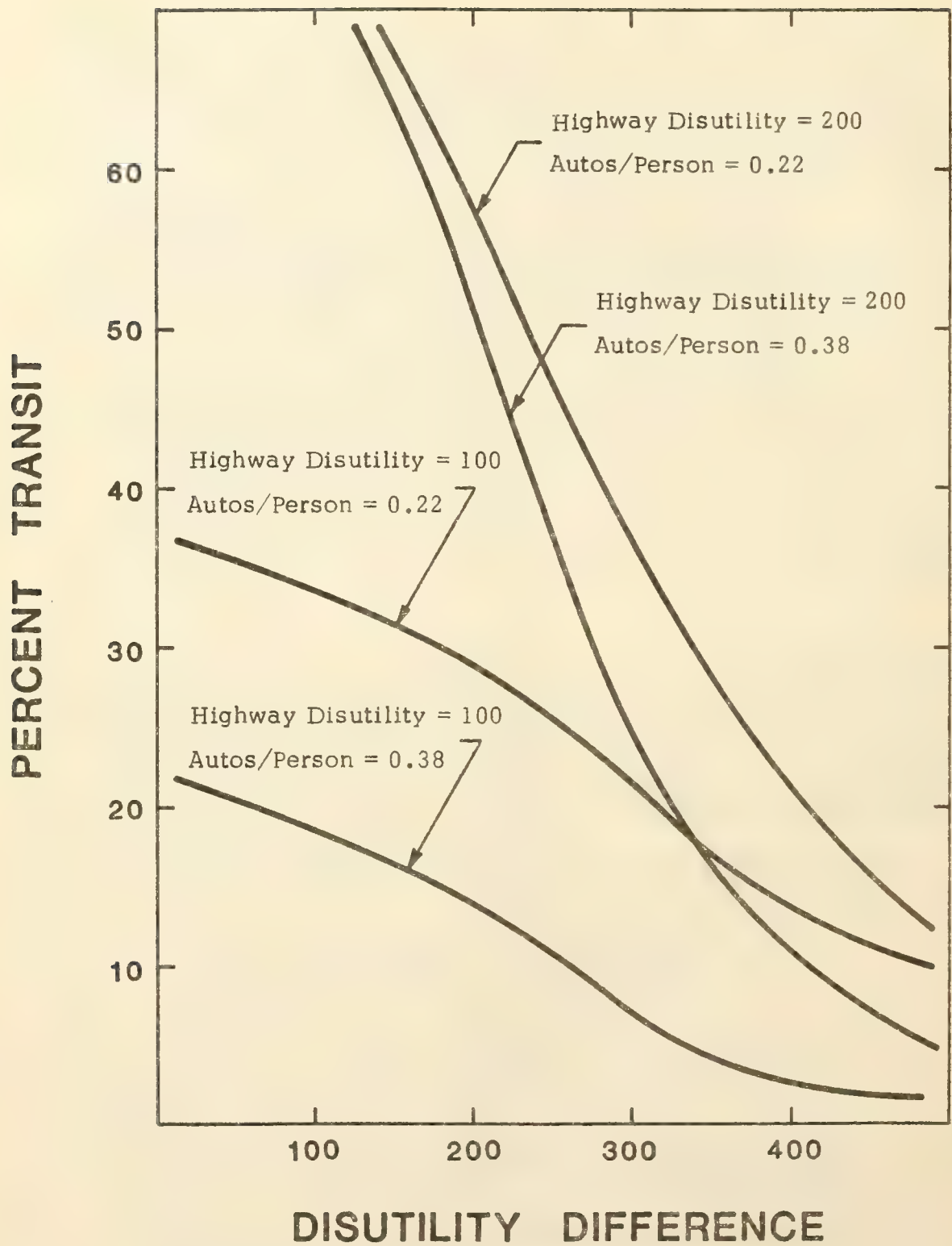


FIGURE C.2

SAMPLE MODE SPLIT
CURVES FOR HOME-
BASED WORK TRIPS

8

The assignment results are then accumulated by station, link, line or mode. Since the direction of the assigned trips is from production end to attraction end, it is necessary to convert the direction so that it represents trips from origin end to destination end. The end result is the average week-day 24-hour transit passengers.

APPENDIX D: PRELIMINARY STREET R.O.W. ANALYSIS

The description which follows includes an inventory and other data collected on the potential street alignments for transit use in the study area. The street alignments identified as having the greatest potential for fixed-route transit application (see Figure D-0) were based on the following criteria:

1. Providing connection between commercial centers in the study area
2. Having greatest R.O.W. width
3. Providing potential tie-in or transfer to existing transit services
4. Having adjacent land uses most compatible with transit service
5. Providing potential connection between the Midland Branch and Washington/Warren/Blue Hill Corridors

The street alignments inventoried and analyzed in Phase I included:

<u>Figure No.</u>	<u>Street</u>	<u>From</u>	<u>To</u>
D-1	Blue Hill Avenue*	Dudley Street	Mattapan Square
D-2	Washington Street *	Kneeland Street	Forest Hills
D-3	Warren Street *	Dudley Station	Grove Hall
D-4	Dudley Street *	Uphams Corner	Dudley Station
D-5	New Dudley Street *	Dudley Station	Tremont Street
D-6	Ruggles Street *	Washington Street	Huntington Avenue
D-7	Washington Street * (Dorchester)	Grove Hall	Codman Square
D-8	Talbot Avenue *	Blue Hill Avenue	Dorchester Avenue
D-9	Columbia Road *	S. E. Expressway	Grove Hall
D-10	Seaver Street/ Columbus Avenue *	Jackson Square	Blue Hill Avenue
D-11	Martin Luther King Boulevard *	Warren Street	Washington Street
D-12	Morton Street	Forest Hills	Washington Street
D-13	Norfolk Avenue	Cottage Street	Washington Street
D-14	Geneva Avenue	Grove Hall	MBTA Red Line
D-15	Tremont Street	Mass. Turnpike	Roxbury Crossing
D-16	Shawmut Avenue	Mass. Turnpike	Dudley Station
D-17	Harrison Avenue	Mass. Turnpike	Dudley Station
D-18	Proposed Crosstown St.	S. E. Expressway	Columbus Avenue
D-19	Massachusetts Avenue	Mainline RR	Columbia Road

* Includes field survey in addition to data collection from published source and photogrammetric maps.

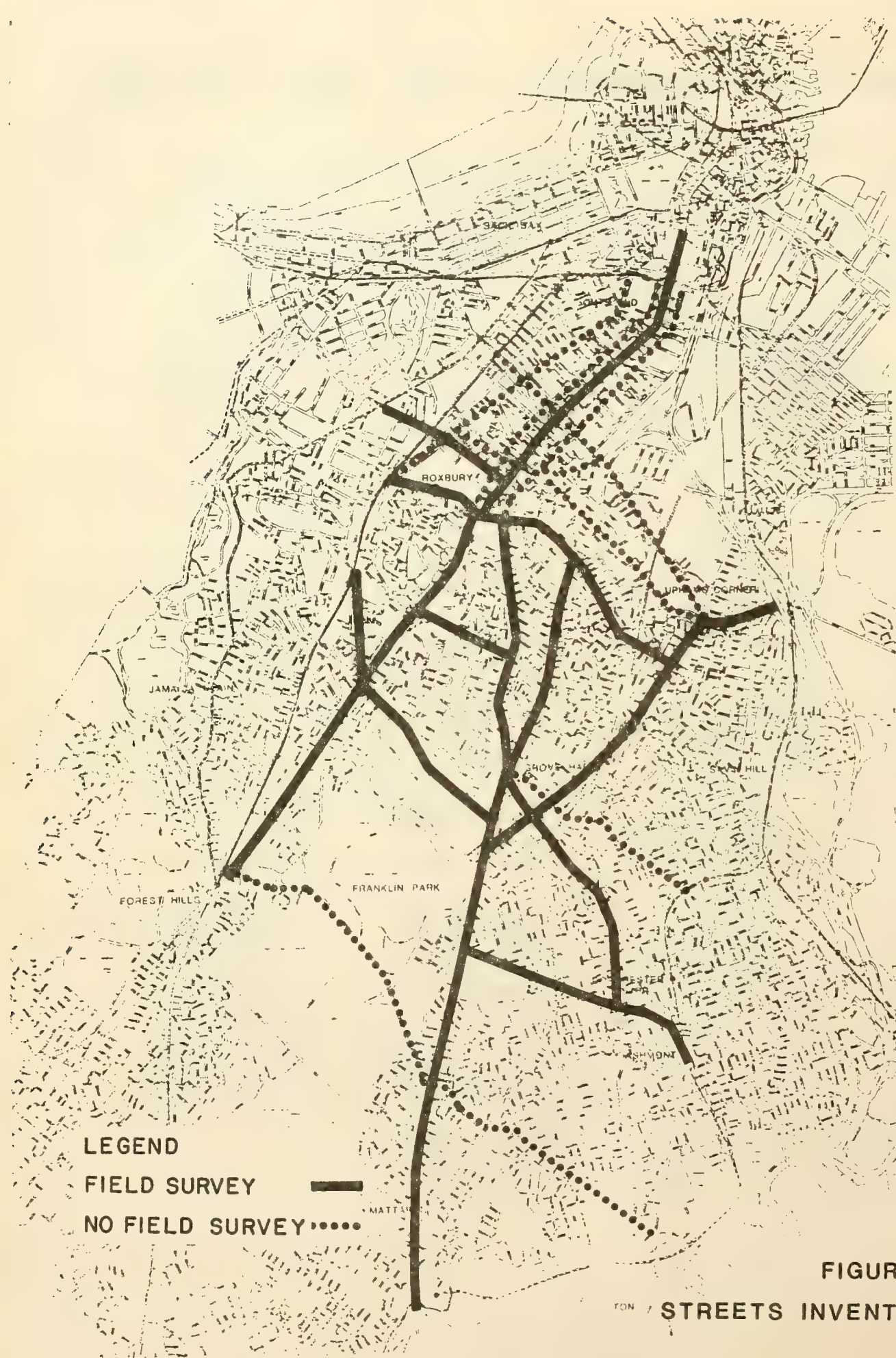


FIGURE D-0

TON / STREETS INVENTORIED

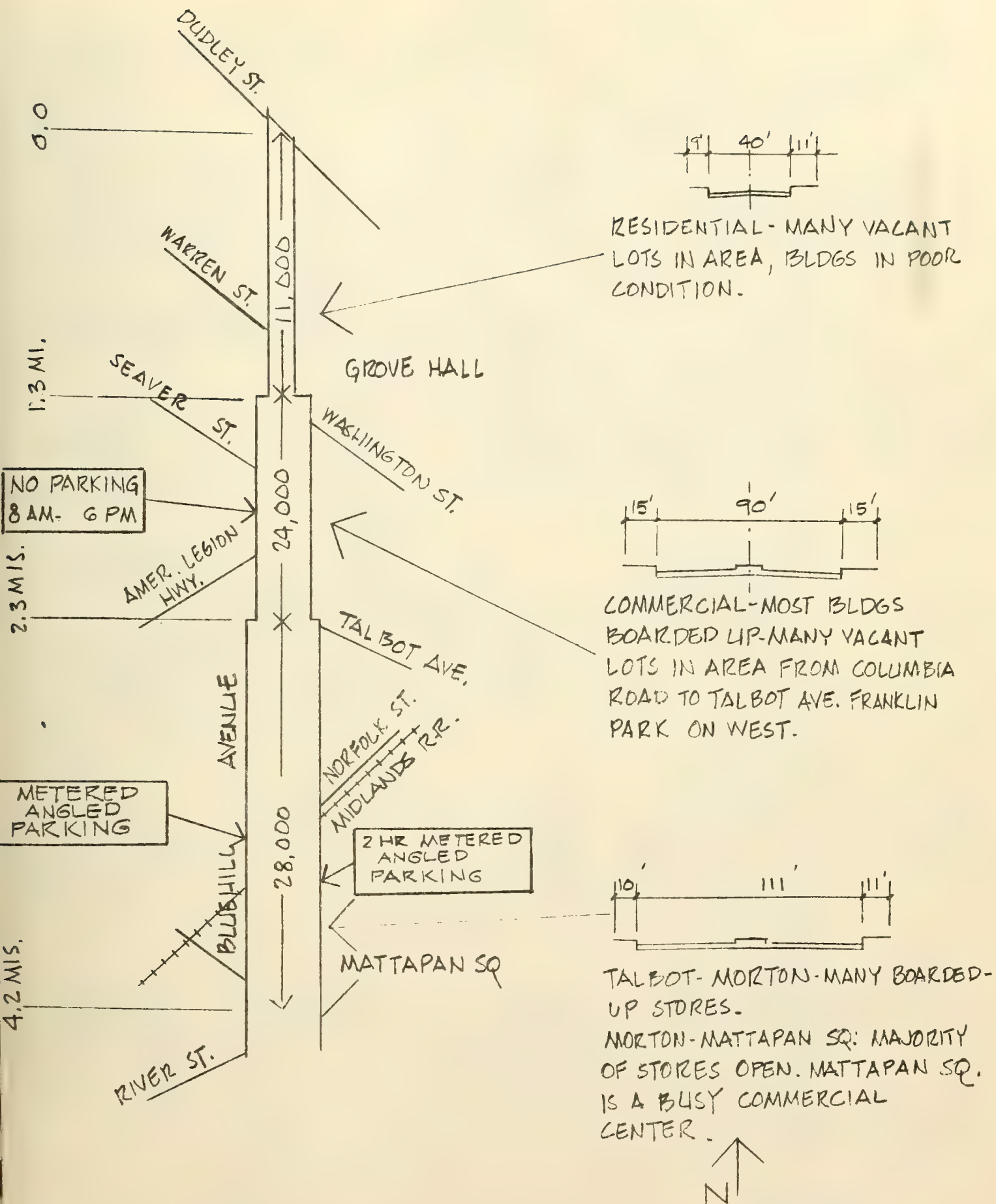


FIGURE D-1

BLUE HILL AVENUE

SCALE 1" = .6 MI.

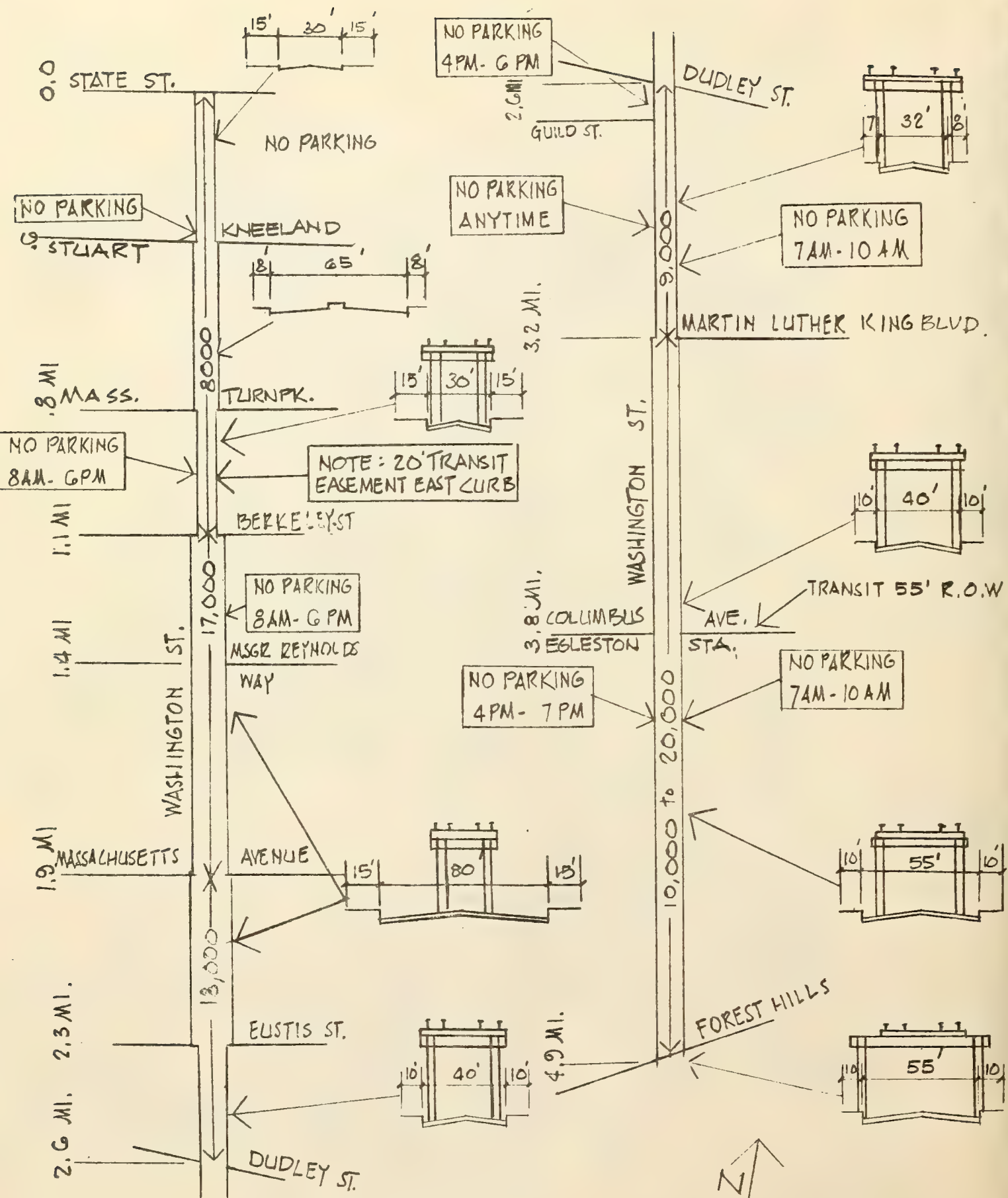


FIGURE D-2
WASHINGTON STREET
SCALE 1" = .3 MI.

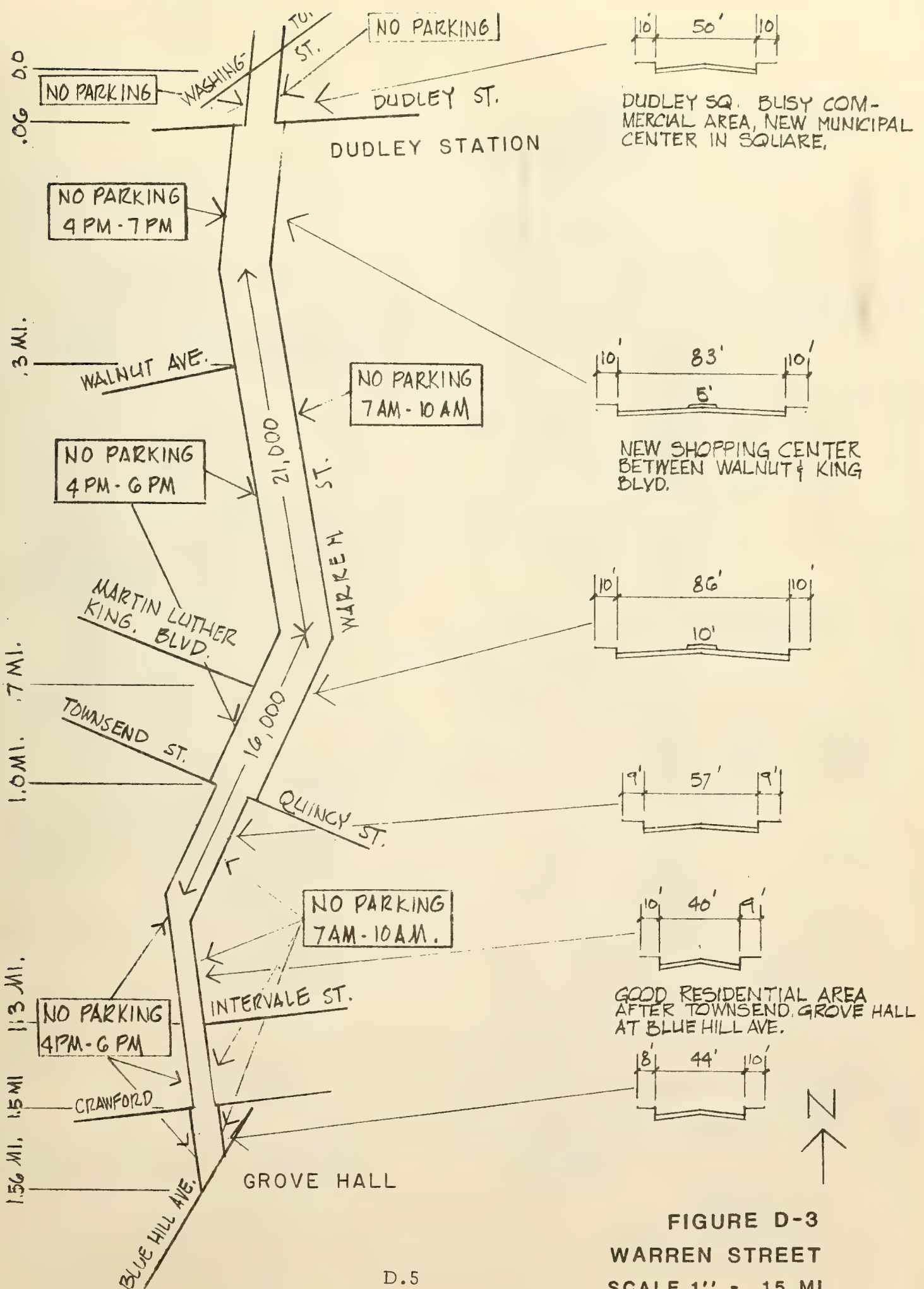
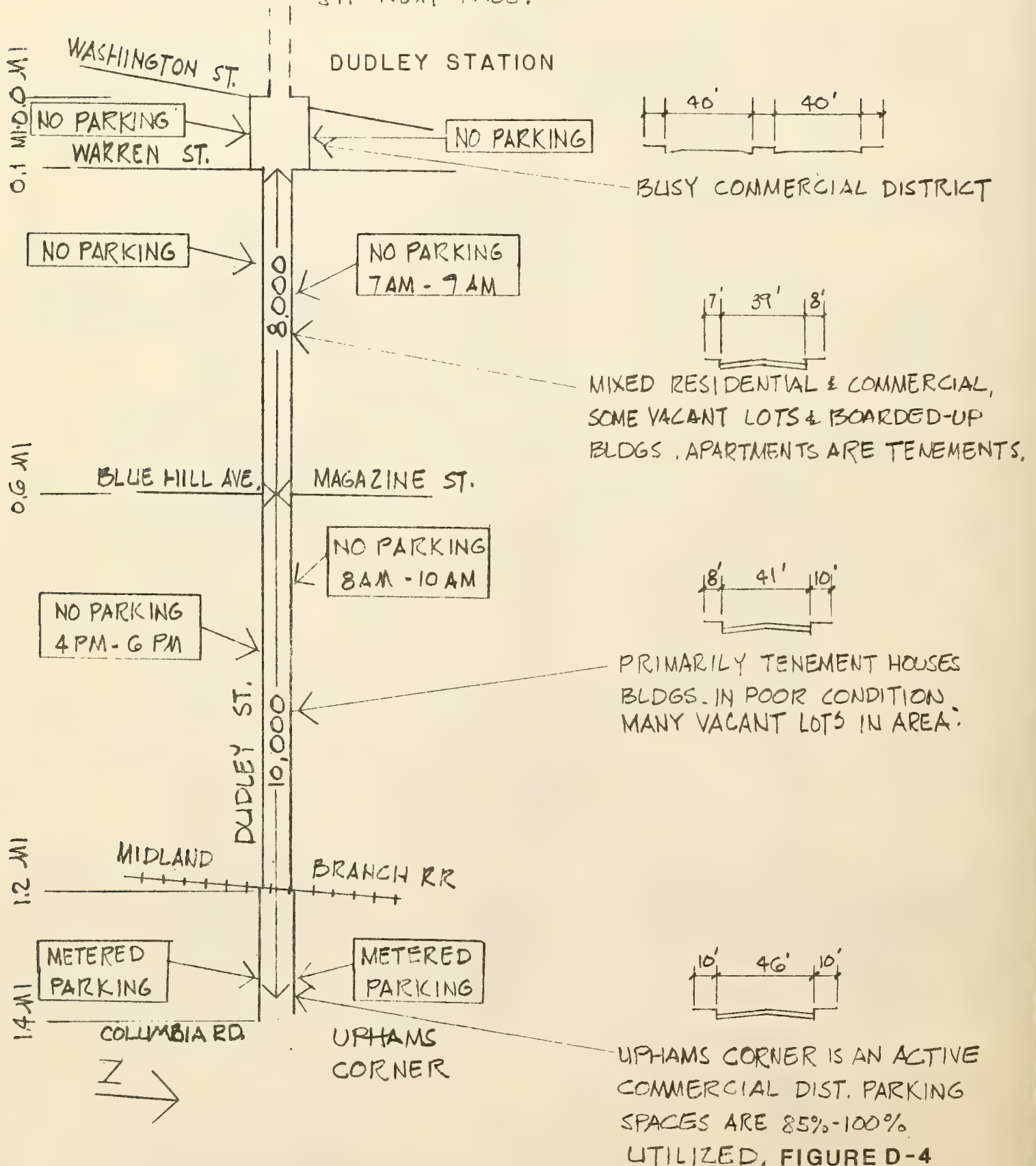


FIGURE D-3
WARREN STREET
SCALE 1" = 0.15 MI

NOTE:
SEE NEW DUDLEY
ST. - NEXT PAGE.



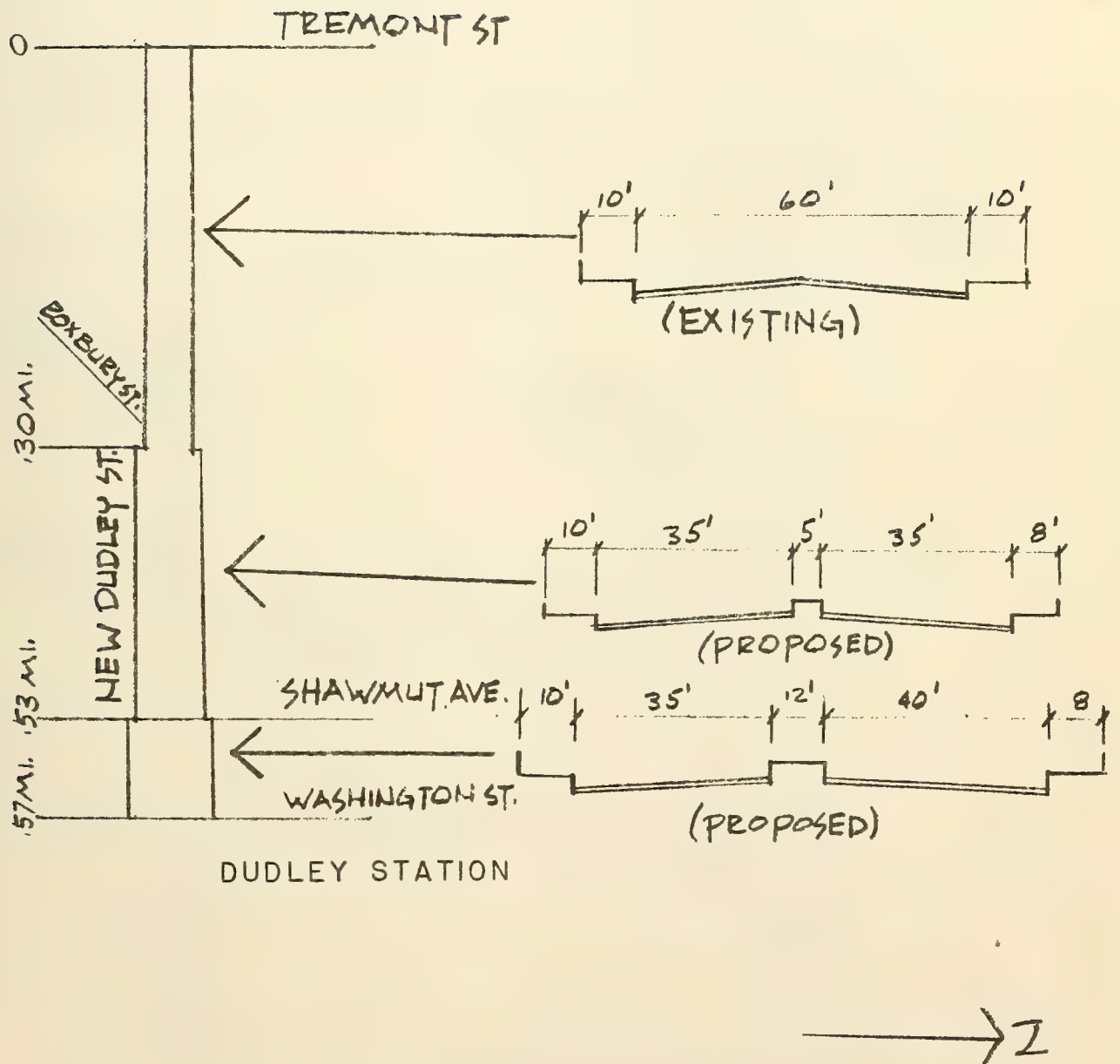
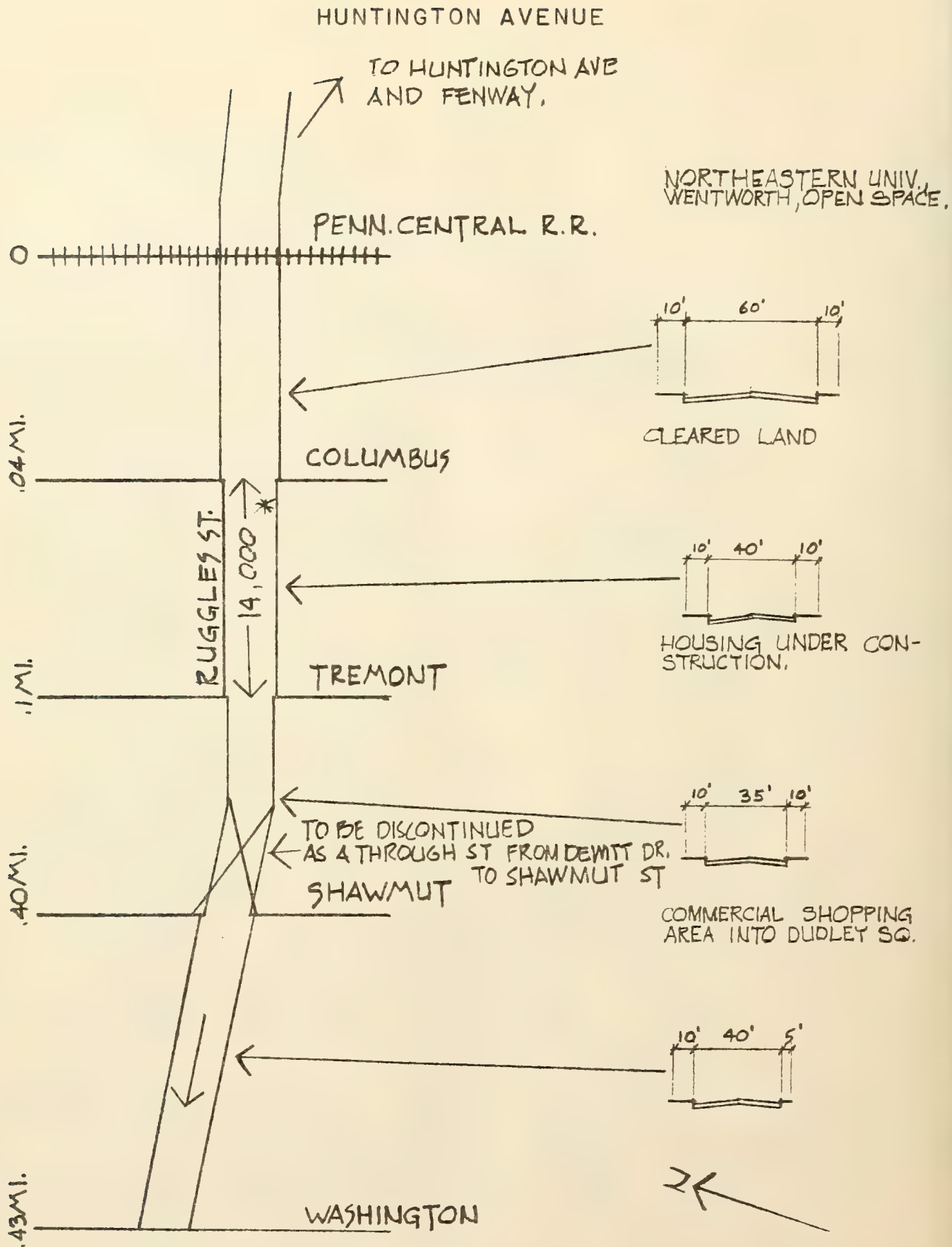


FIGURE D-5
NEW DUDLEY STREET
NOT TO SCALE



* traffic rerouted to Crosstown

FIGURE D-6
RUGGLES STREET
NOT TO SCALE

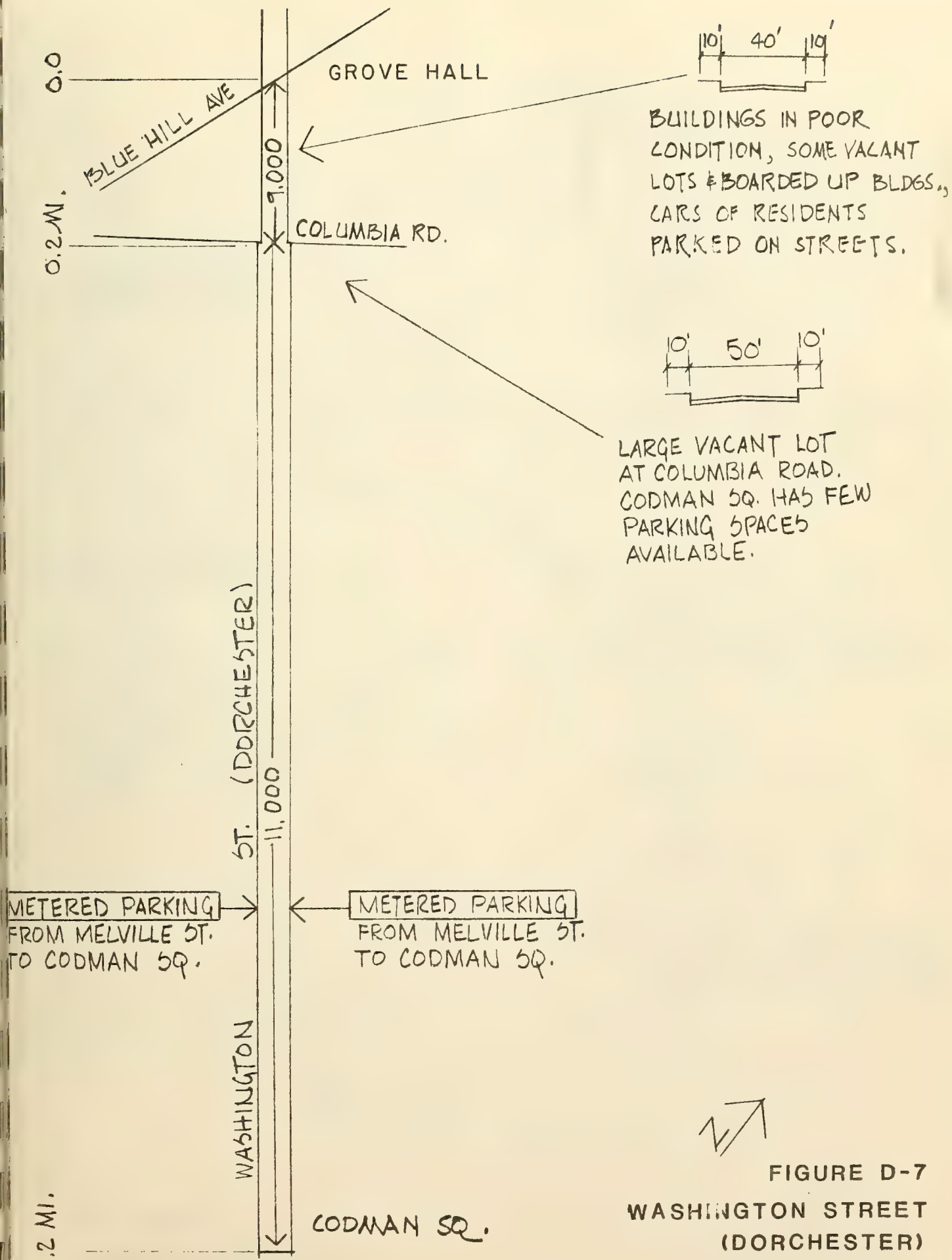


FIGURE D-7
WASHINGTON STREET
(DORCHESTER)
SCALE 1" = .15 MI.

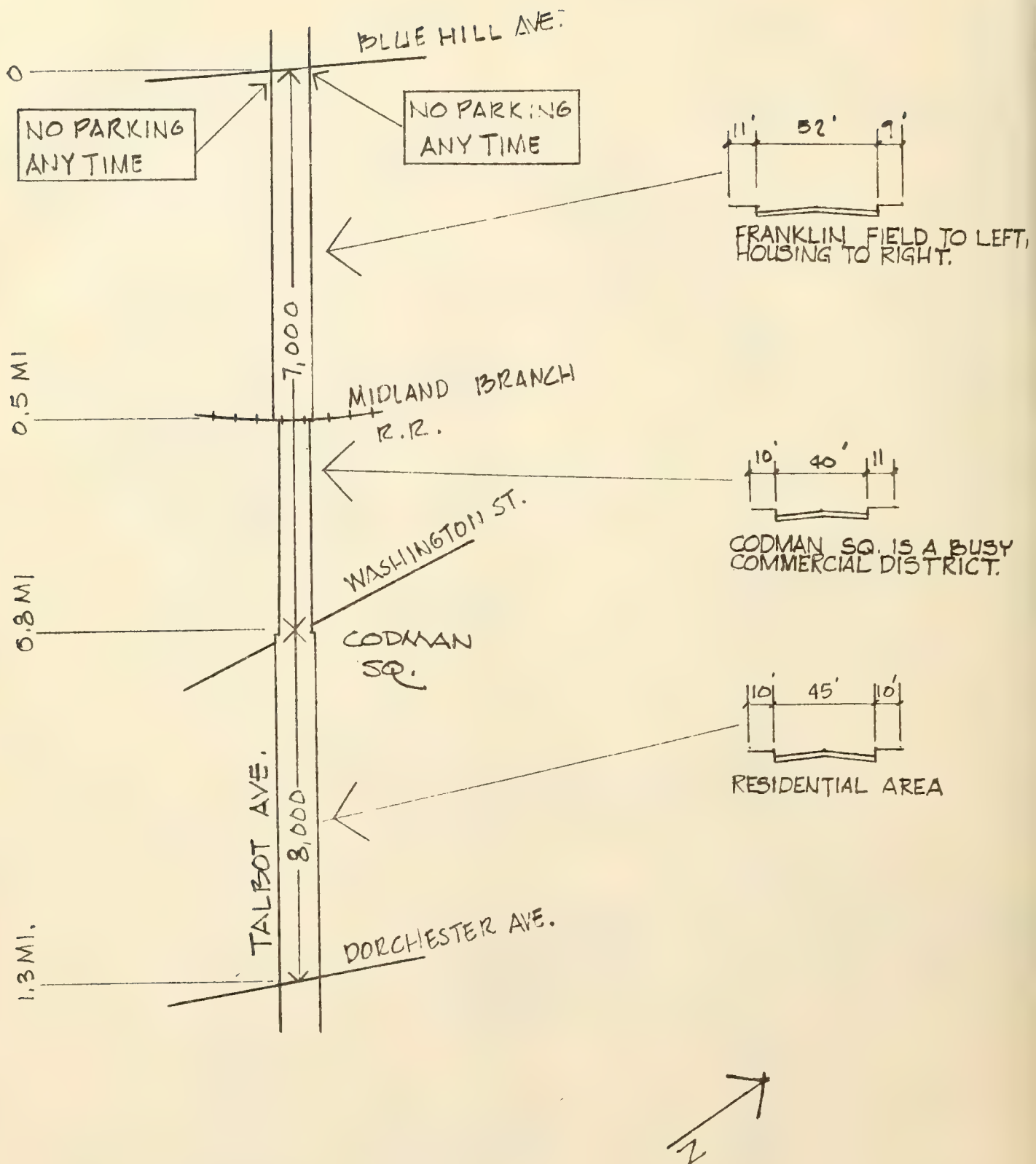


FIGURE D-8
TALBOT AVENUE
SCALE 1" = .2MI.

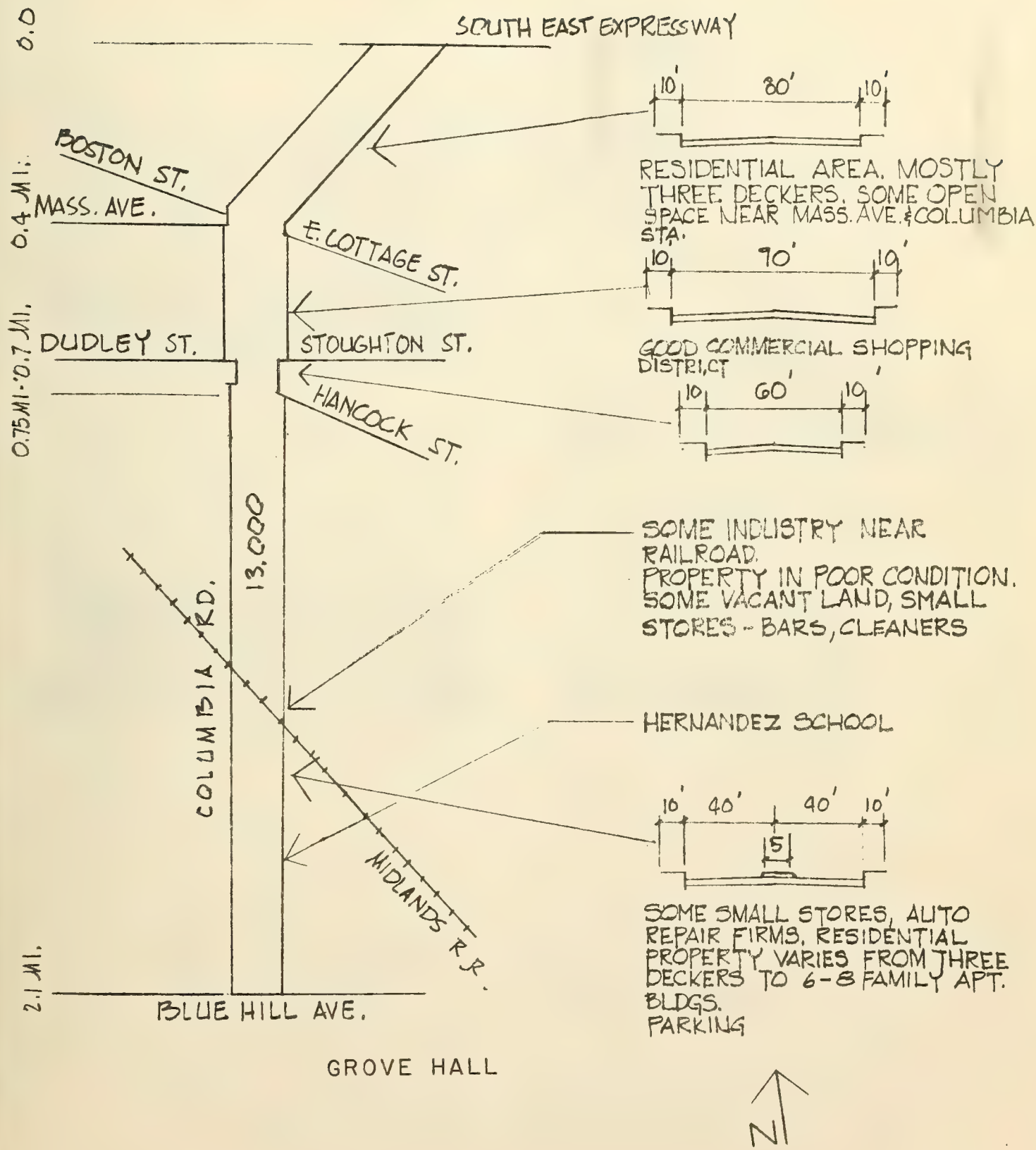


FIGURE D-9
COLUMBIA ROAD
SCALE 1" = .3 MI.

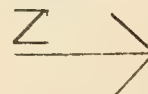
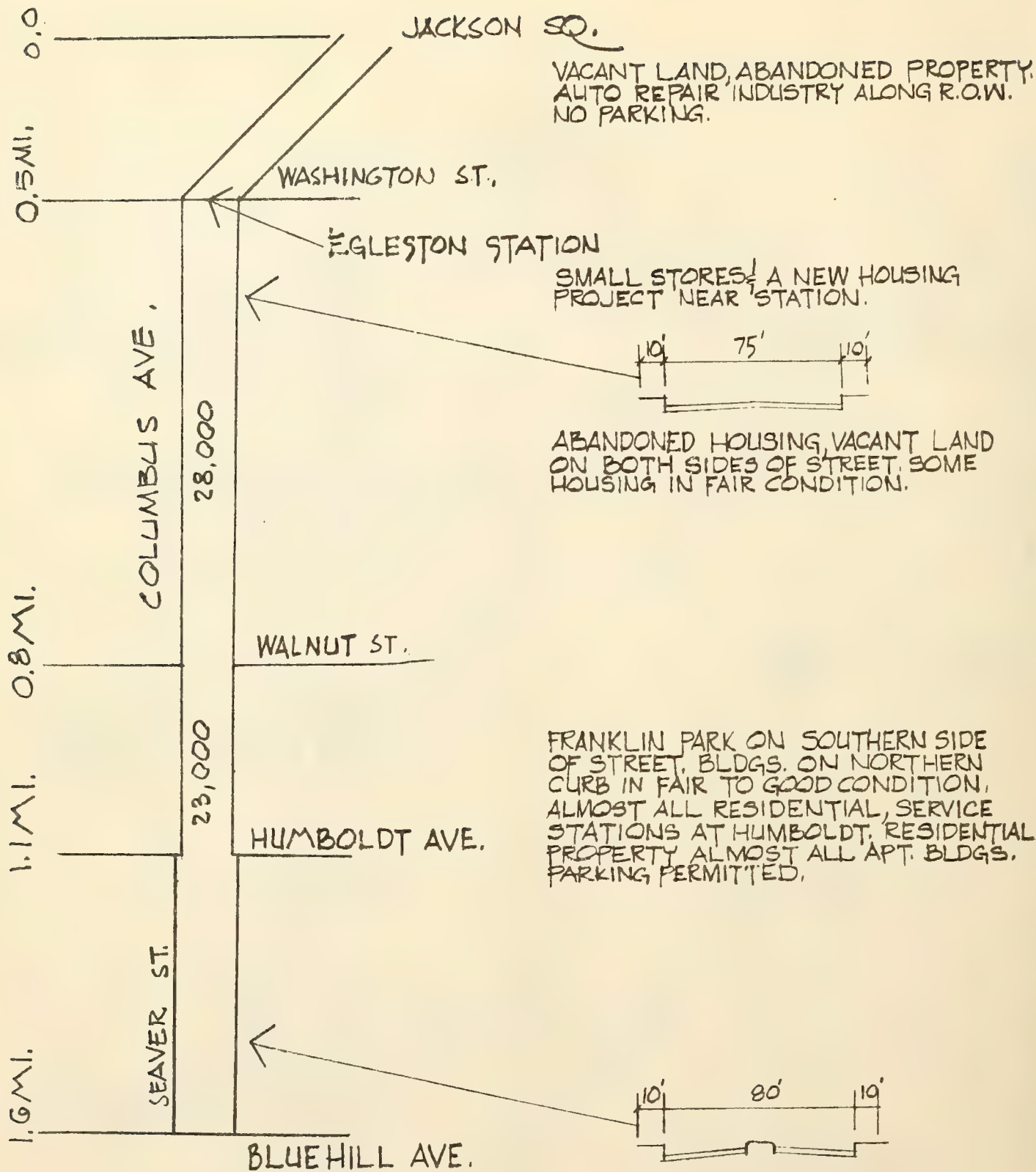


FIGURE D-10
SEAVAR STREET / COLUMBUS AVENUE

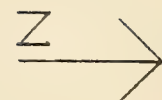
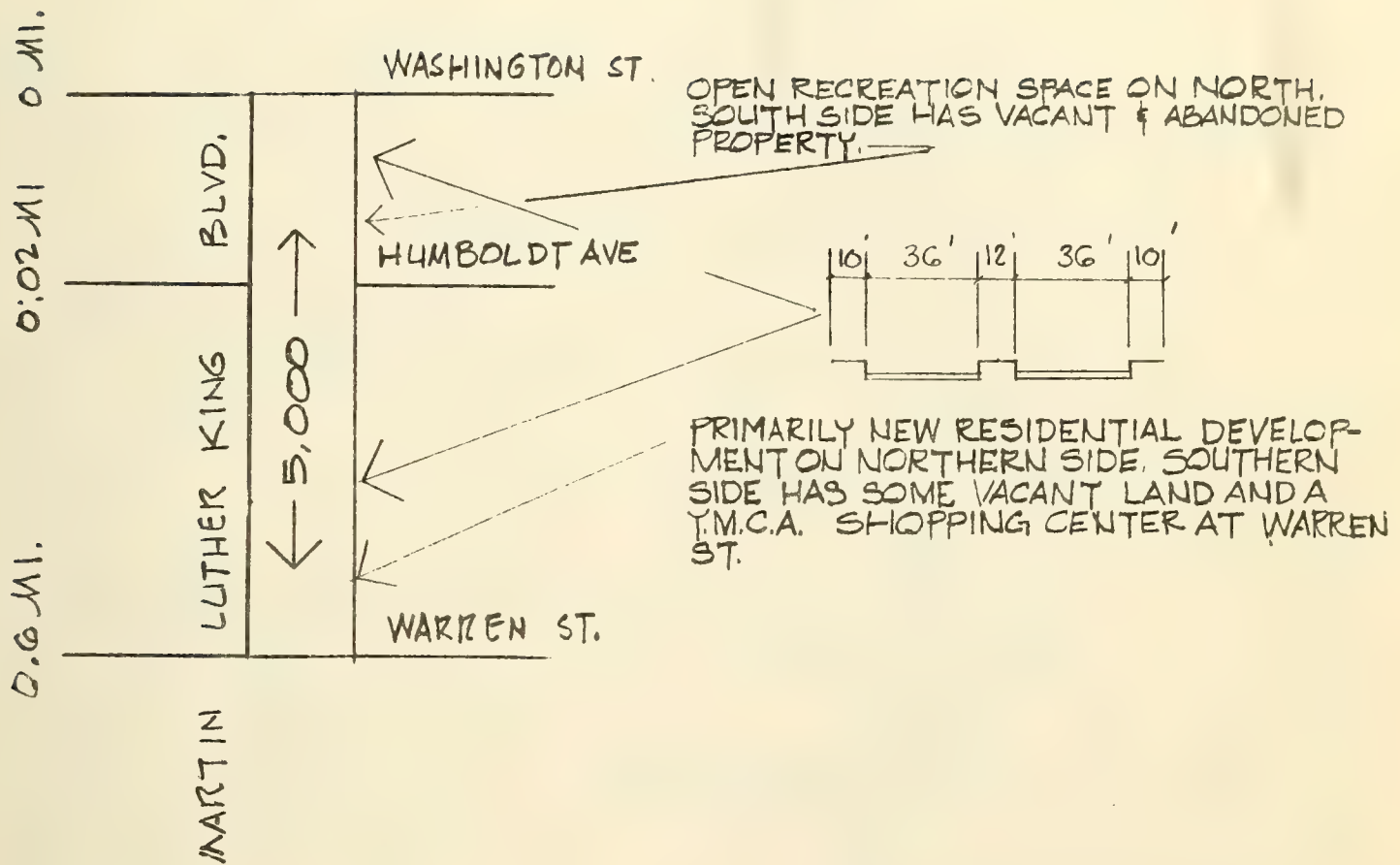


FIGURE D-11
MARTIN LUTHER KING BLVD.
NOT TO SCALE

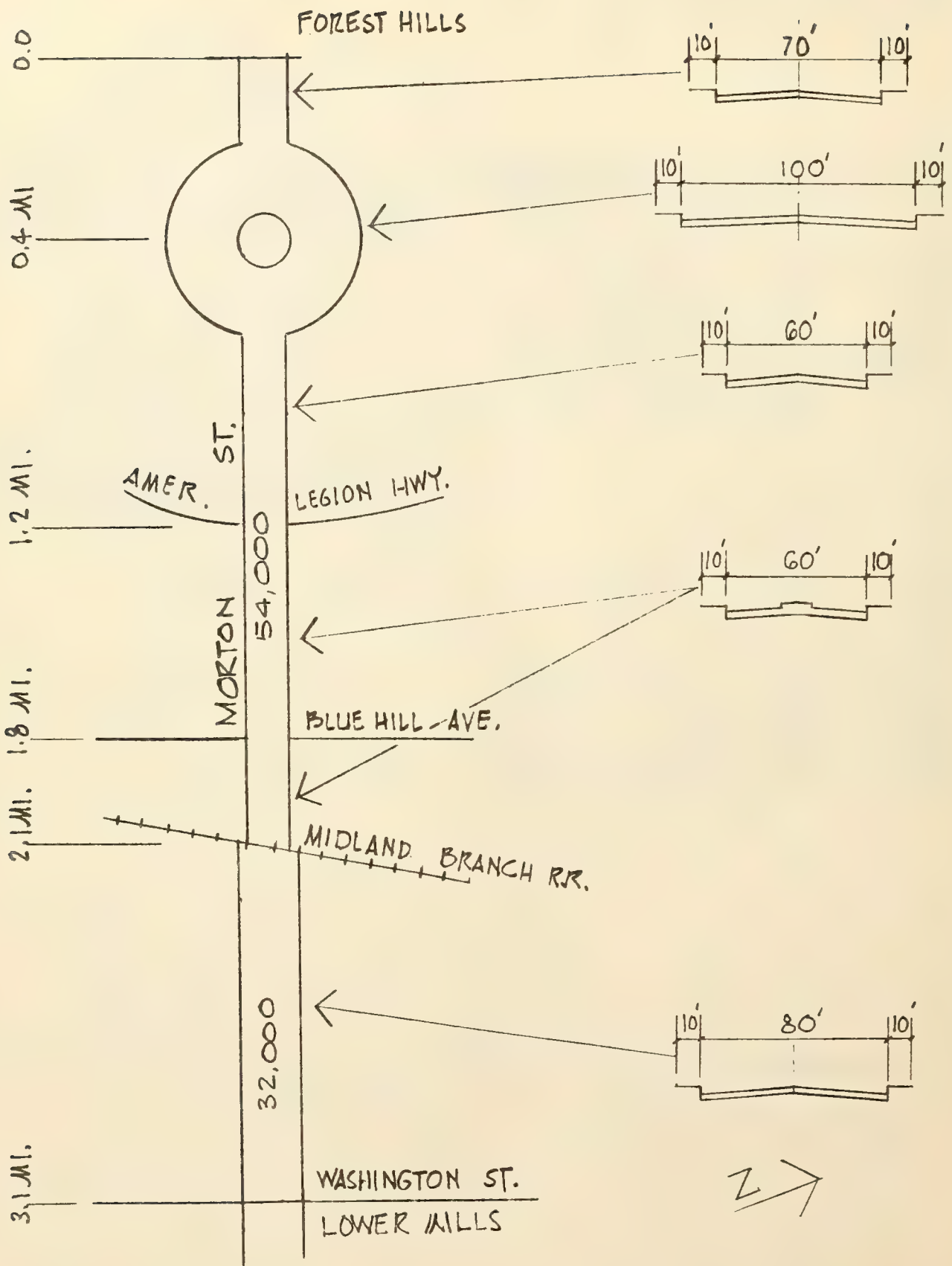


FIGURE D-12
MORTON STREET
SCALE 1" = .4 MI.

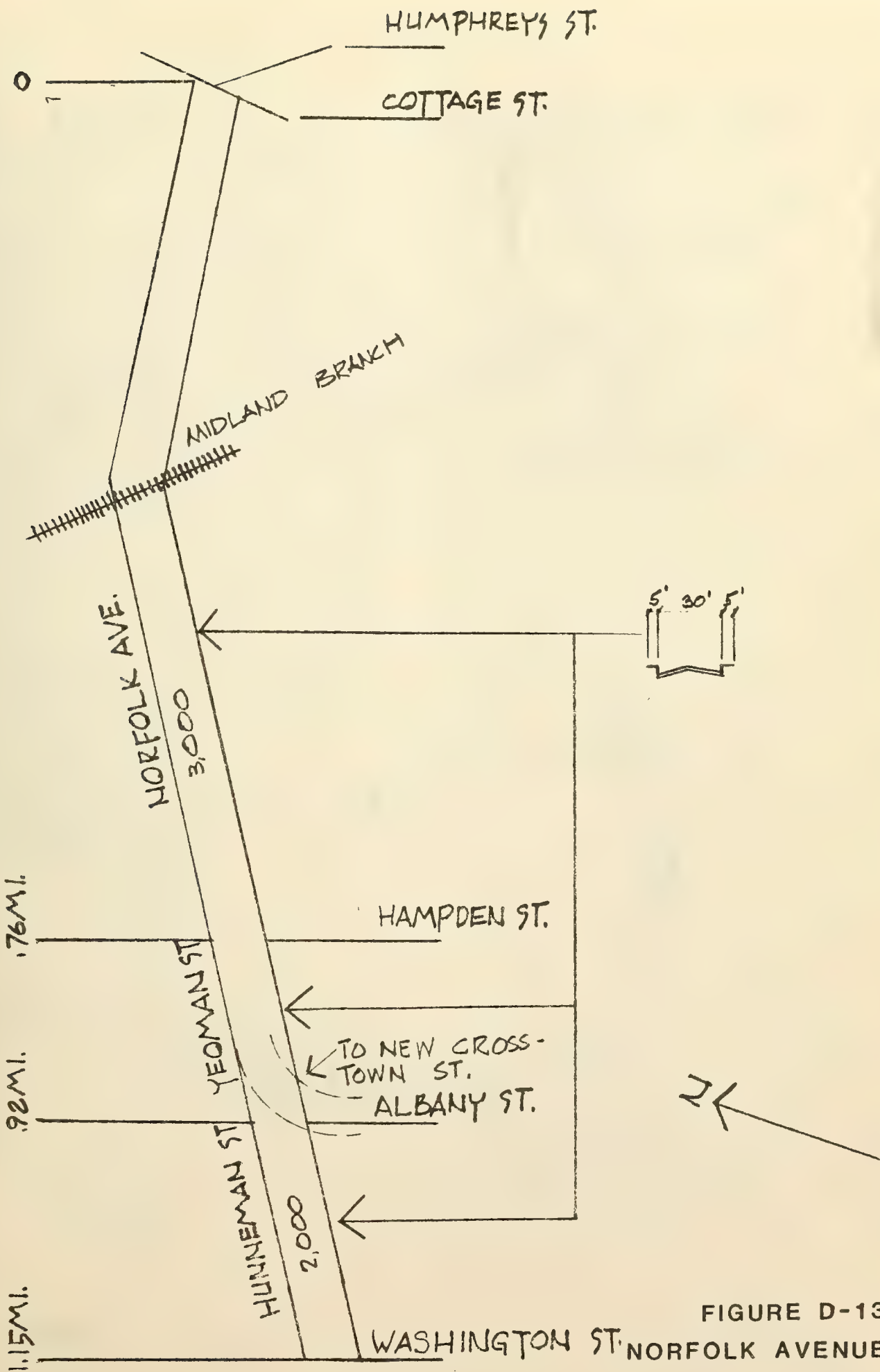


FIGURE D-13
NORFOLK AVENUE
NOT TO SCALE

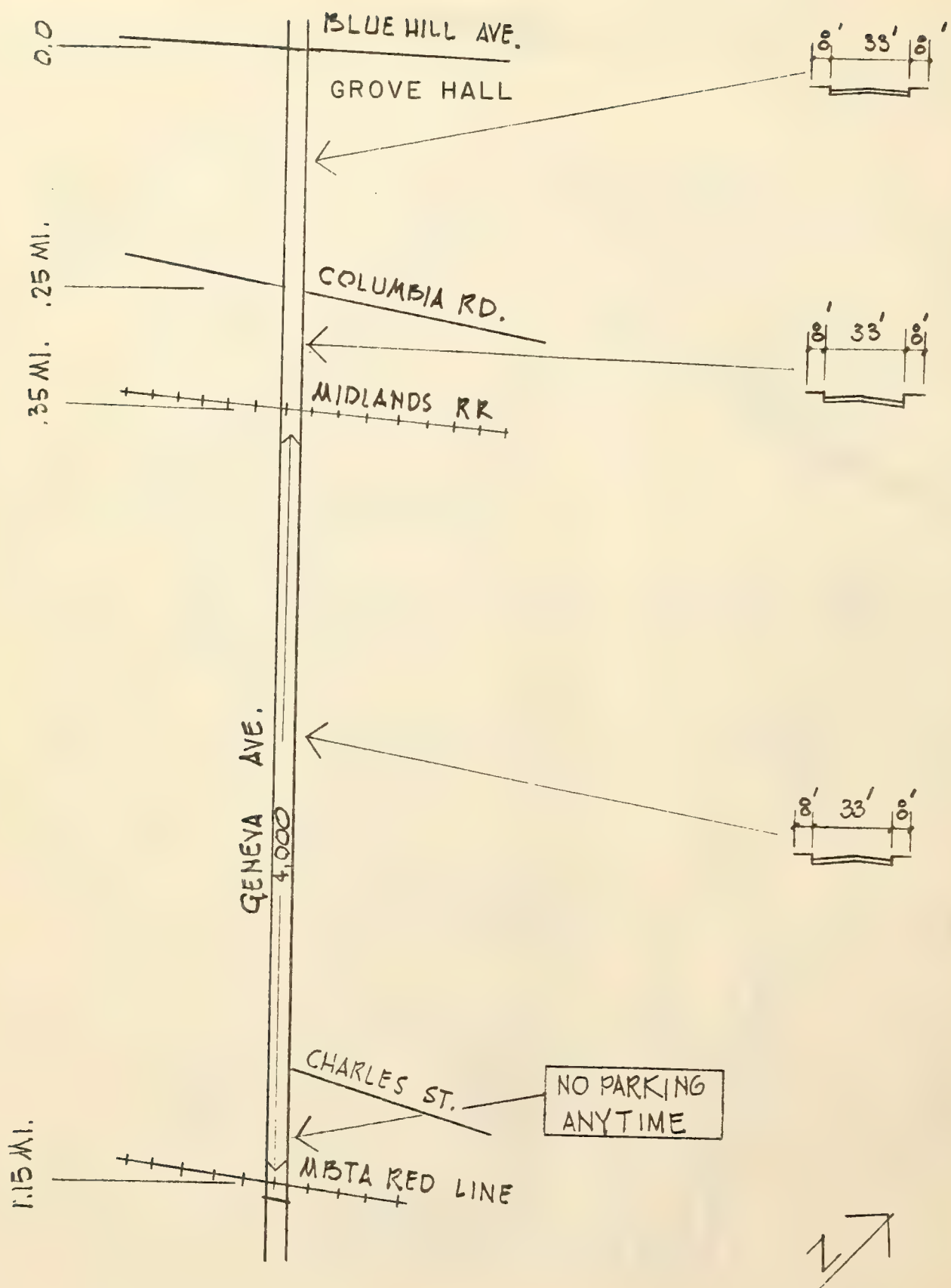


FIGURE D-14
GENEVA AVENUE
SCALE 1" = .15 MI.

MASS. TURNPIKE

NOT TO SCALE
.08 .02 0 MI.

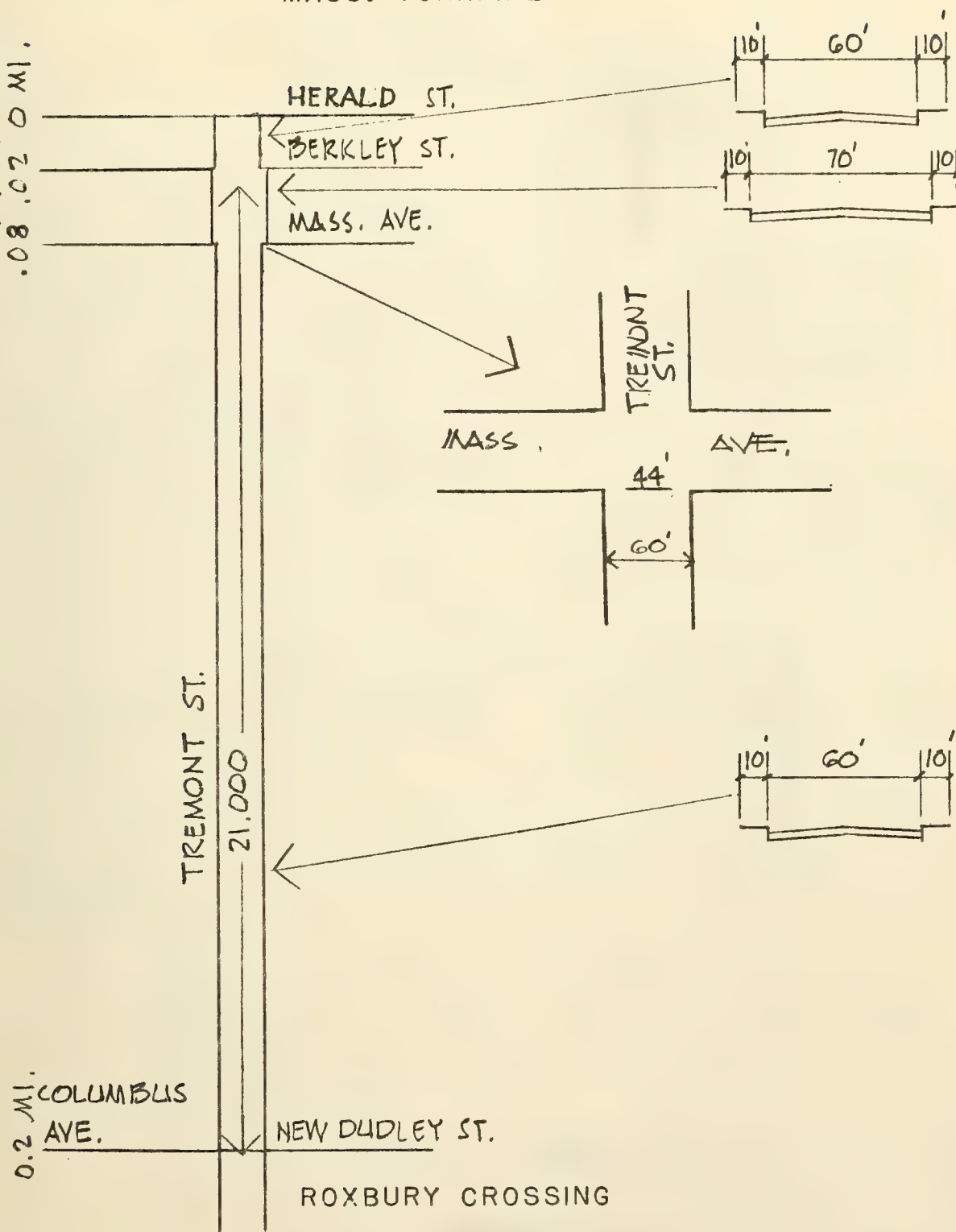


FIGURE D-15
TREMONT STREET
NOT TO SCALE

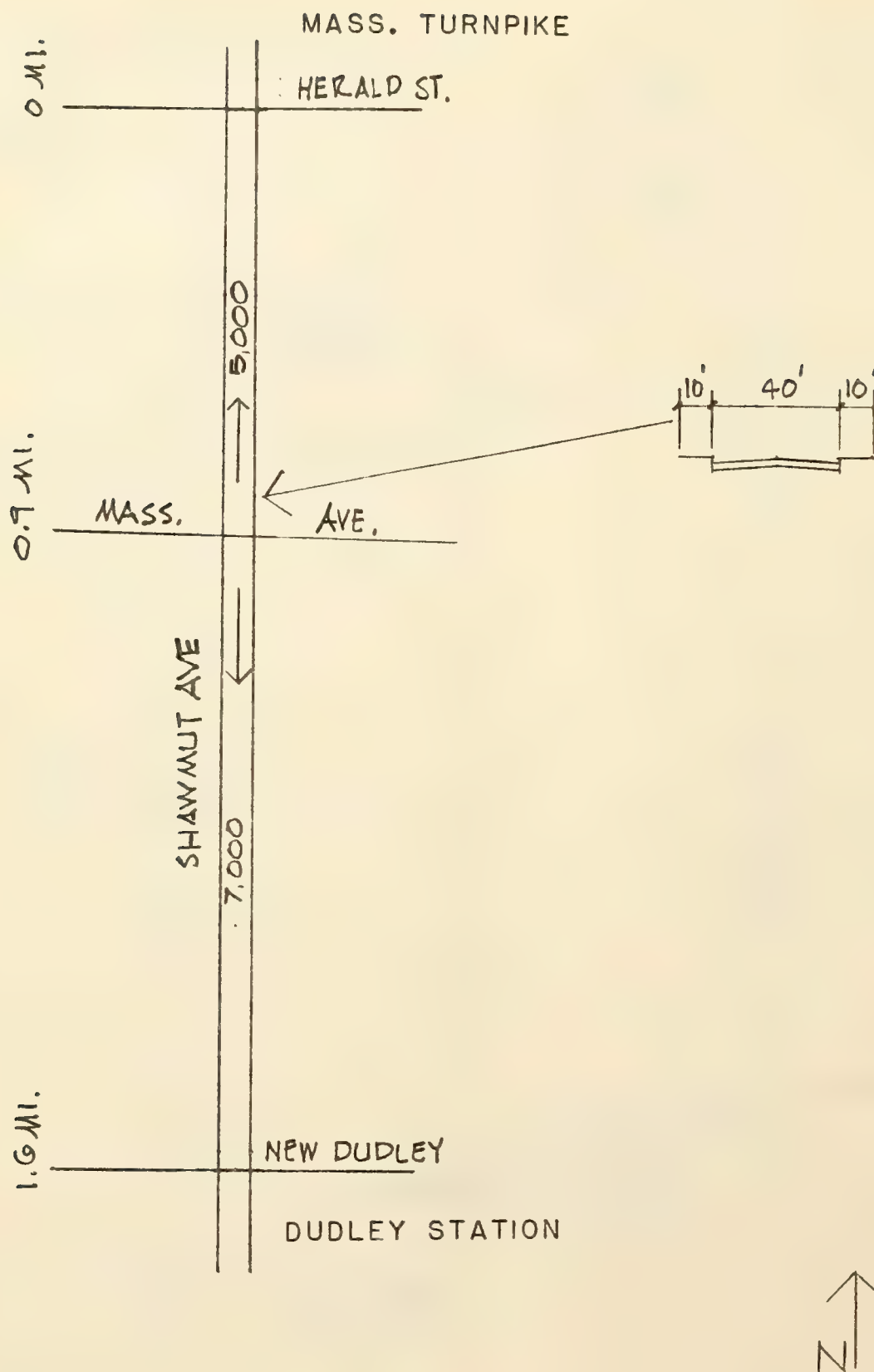


FIGURE D-16
SHAWMUT AVENUE
NOT TO SCALE

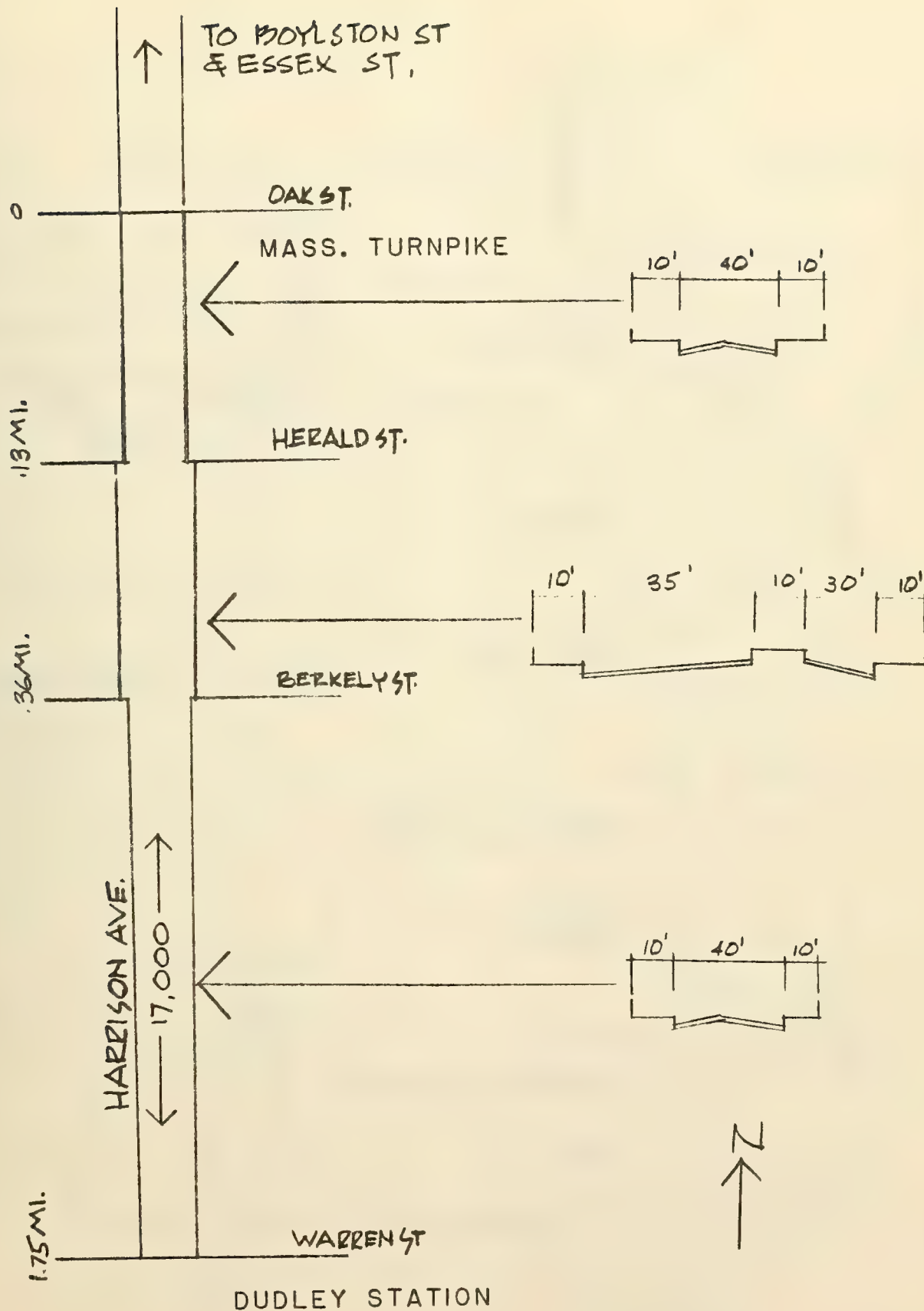


FIGURE D-17
HARRISON AVENUE
NOT TO SCALE

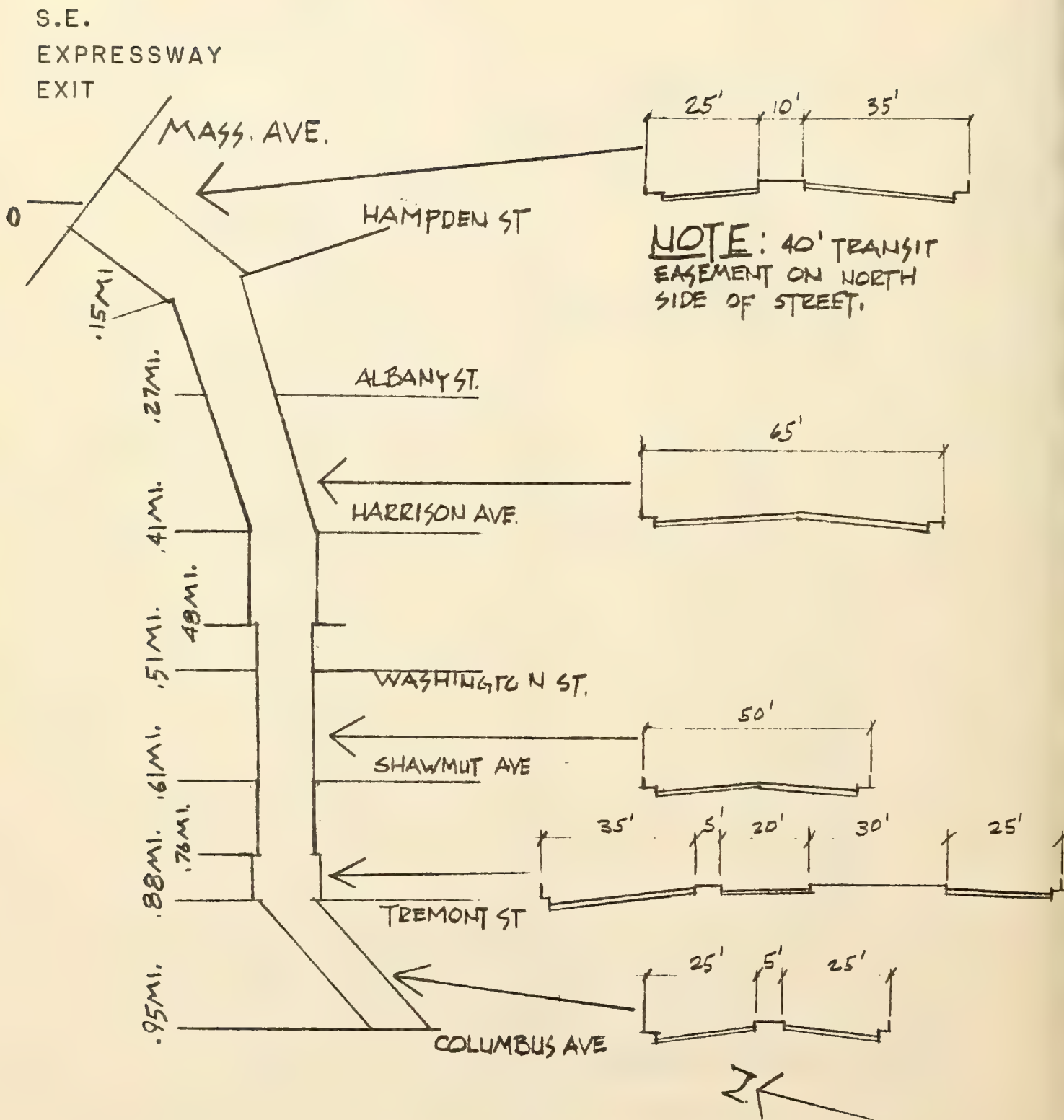


FIGURE D-18
PROPOSED CROSSTOWN ST.
NOT TO SCALE

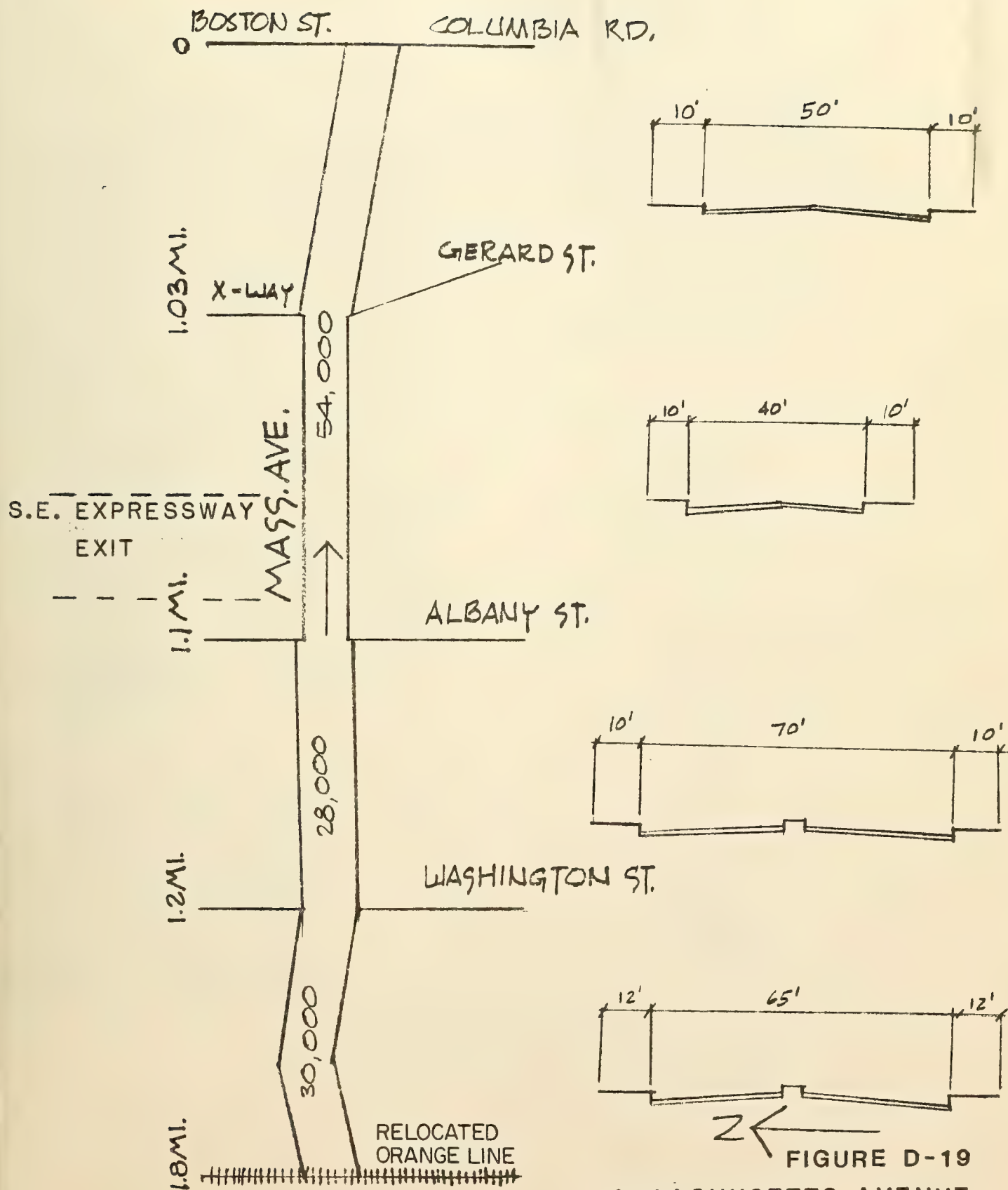


FIGURE D-19
MASSACHUSETTS AVENUE
 NOT TO SCALE

APPENDIX E: DESCRIPTION OF SPECIFIC TRANSIT ALTERNATIVES

This Appendix describes the fixed facility and system operating characteristics developed for the eleven specific alternatives in Chapter 9. It summarizes such considerations as horizontal and vertical alignment, station spacings, train length and capacity, operating speed, peak period headways, train turn-back points, and feeder bus networks.

A set of informational notes which apply to all alternatives is included on pages E.40-41 for the following characteristics:

- a Alignment and Stations
- b Train Configurations
- c Average Operating Speeds
- d Peak Period Headways
- e Bus Feeder Operating Characteristics

<u>Alternative</u>	<u>Page</u>
1 LRV	E.2
2 LRV	E.5
3 LRV	E.8
4 LRV	E.11
5 Rapid Transit/LRV	E.15
6 Busway	E.18
7 LRV/Commuter Rail	E.21
8 Rapid Transit	E.25
9 LRV/Bus	E.28
10 Local Bus	E.32
11 Rapid Transit/LRV	E.35

ALTERNATIVE 1 - WASHINGTON - SEAVER - BLUE HILL, LRV

Table 1 - Operating Characteristics

1. Boylston Street Station (Central Subway) to Mattapan Square: 6.99 Miles ^a
2. Stations: 20 (not including Boylston or Mattapan Stations) ^a
Average Spacing Between Stations:
Boylston to Dudley .29 Miles
Dudley to Franklin Park Zoo .40 Miles
Franklin Park Zoo to Mattapan .32 Miles
3. Vertical Profile (Alternative Construction Assumptions):
Boylston to Dudley - Street median with traffic signal priority
Dudley to Seaver Street - Either tunnel or street median with traffic signal priority
(via Washington)
Seaver Street - Street median with traffic signal priority
Franklin Park Zoo to Mattapan - Street median with traffic signal priority
4. Train Length: 2 Boeing LRV/Train at Peak Periods ^b
5. Train Capacity: (160 Pass./LRV) (2 LRV/Train) = 320 Pass./Train ^b
6. Assumed Average Operating Speed (m.p.h.) ^c

	Daily Average (with Signal Priority)	AM Inbound Peak (.94 Peak Factor)
Boylston to Dudley	16	15
Dudley to Franklin Park Zoo		
(In Median)	19	18
(In Tunnel)	23	23
Franklin Park Zoo to Mattapan	16.7	15.7
7. Headways (Inbound AM Peak Period)
Boylston to Mattapan: 5 Minutes ^d
8. Average Station Dwell Time (Train Stopped in Station): 20 Seconds
9. Assumed to Turn Around at North Station
(Boylston to North Station, 10 m.p.h.)

Table 2

Bus Route Operating Characteristics for A.M. Peak Period^e

	Route	<u>Route Length</u> (One way in miles)	<u>Headways</u> (In minutes)	<u>Operating Speed</u> (mph w/o layover)
* 1	Harvard-Dudley	4.2	5	8
8	Columbia Point-Ruggles Station	3.4	15	11
9	City Point-Copley	3.5	8	10
10/47	City Point-Central Sq. via Dudley	9.3	10	10
11	City Point-Kneeland Street	3.4	7	10
13/68	Savin Hill-Copley	4.2	15	10
* 15/41	Kane Square-Centre & Elliot	4.5	7	10
16	Andrew-Jackson	Eliminated **		
16A	U. Mass.-Forest Hills	6.2	12	12
* 17	Fields Corner-Andrew	3.3	9	12
18	Ashmont-Andrew	4.6	30	14
19/44	Fields Corner-Dudley	4.0	10	11
* 21	Ashmont-Forest Hills	4.4	12	15
22	Ashmont-Jackson Square	4.2	6	11
* 23	Ashmont-Ruggles	4.4	5	11
25	Ashmont-Mattapan	3.0	12	10
26	Ashmont-Morton Station	2.0	7	11
* 27	Ashmont-Mattapan	2.3	30	12
* 28	Mattapan-Arborway	3.7	20	15
29	Mattapan-Egleston	Eliminated **		
* 30	Mattapan-Roslindale Square	2.7	20	13
42	Forest Hills-Dudley	Eliminated **		
43	Egleston-Stuart Street	Eliminated **		
45	Franklin Park-Ruggles	3.1	9	10
46	Dudley-Heath & S. Huntington	2.0	30	12
48	Dudley-Boston State Hospital	Eliminated **		
* 49	Northampton-Kneeland Street	Eliminated **		
66	Dudley-Allston	4.0	5	10

* No alignment modifications made from proposed bus routes for Relocated Orange Line (Base Case II)

** Eliminated from proposed feeder bus network for Relocated Orange Line (Base Case II)

ALT. 1

WASHINGTON- SEAVER- BLUE HILL, L.R.V.

FIGURE 5-1

FIGURE E.1

ALTERNATIVE 2 - WASHINGTON - WARREN - BLUE HILL, LRVTable 1 - Operating Characteristics

1. Boylston Street Station (Central Subway) to Mattapan Square: 6.5 Miles^a
2. Stations: 19 (not including Boylston or Mattapan Stations)^a
 Average Spacing Between Stations:

Boylston to Dudley	.29 Miles
Dudley to Grove Hall	.37 Miles
Grove Hall to Mattapan	.33 Miles
Total Alignment	.33 Miles
3. At-grade intersections: 34 (every .2 miles)
4. Train Length: 2 Boeing LRV/Train^b
5. Train Capacity: (160 Pass./LRV) (2 LRV/Train) = 320 Pass./Train^b
6. Assumed Average Operating Speed^c
 (mph):

	<u>Daily Average</u> <u>(with Signal Priority)</u>	<u>AM Inbound Peak</u> <u>(.94 Peak Factor)</u>	
Boylston - Dudley	16	15	
Dudley - Grove Hall	17.8	16.7	
	(22.5 in tunnel)	(22.5)	19.1
Grove Hall - Mattapan	16.7	15.7	
<u>Total Alignment *</u>	<u>17.2</u>	<u>16.2</u>	
7. Trip Times (Inbound AM Peak Period)

Dudley to Boylston	8.2 Minutes
Grove Hall to Boylston	12.9 Minutes
Mattapan to Boylston	24.03 Minutes
8. Headways (Inbound AM Peak Period)
 Mattapan to Boylston St.: 5 Minutes^d
9. Average Station Dwell Time (Train Stopped in Station): 20 Seconds
10. Assumed to Turn Around at North Station (Boylston to North Station, 10 MPH)

Table 2

Bus Route Operating Characteristics for A.M. Peak Period^e

	Route	Route Length (one way in miles)	Headways (in minutes)	Operating Speed (mph w/o layover)
* 1	Harvard-Dudley	4.2	5	8
8	Columbia Point-Ruggles Station	3.4	15	11
9	City Point-Copley	3.5	8	10
10/47	City Point-Central Sq. via Dudley	9.3	10	10
*11	City Point-Kneeland	3.4	7	10
13/68	Savin Hill-Copley	4.2	15	10
*15/41	Kane Square-Centre & Elliot	4.5	7	10
16	Andrew-Jackson	4.3	12	11
*16A	U. Mass.-Forest Hills	6.2	25	12
*17	Fields Corner-Andrew	3.3	9	12
*18	Ashmont-Andrew	4.6	30	14
19/44	Fields Corner-Dudley	4.0	10	11
*21	Ashmont-Forest Hills	4.4	12	15
22	Ashmont-Jackson Square	3.6	6	11
23	Ashmont-Jackson Square	4.0	5	11
25	Ashmont-Mattapan	3.0	12	10
26	Ashmont-Morton Station	2.0	7	11
*27	Ashmont-Mattapan	2.3	30	12
28	Mattapan-Arborway	3.7	20	15
29	Mattapan-Egleston	Eliminated **		
*30	Mattapan-Roslindale Square	2.7	20	13
42	Forest Hills-Dudley	2.7	12	10
43	Egleston-Stuart St.	Eliminated **		
*45	Dudley- Franklin Park	2.4	10	11
46	Dudley-Heath & S. Huntington	2.0	30	12
48	Dudley-Boston State Hospital	Eliminated **		
*49	Northampton-Kneeland Street	Eliminated **		
*66	Dudley-Allston	4.0	5	10

* No alignment modifications made from proposed bus routes for Relocated Orange Line (Base Case II)

** Eliminated from proposed feeder bus network for Relocated Orange Line (Base Case II)

ALT. 2
WASHINGTON-
WARREN-
BLUE HILL,
L.R.V.

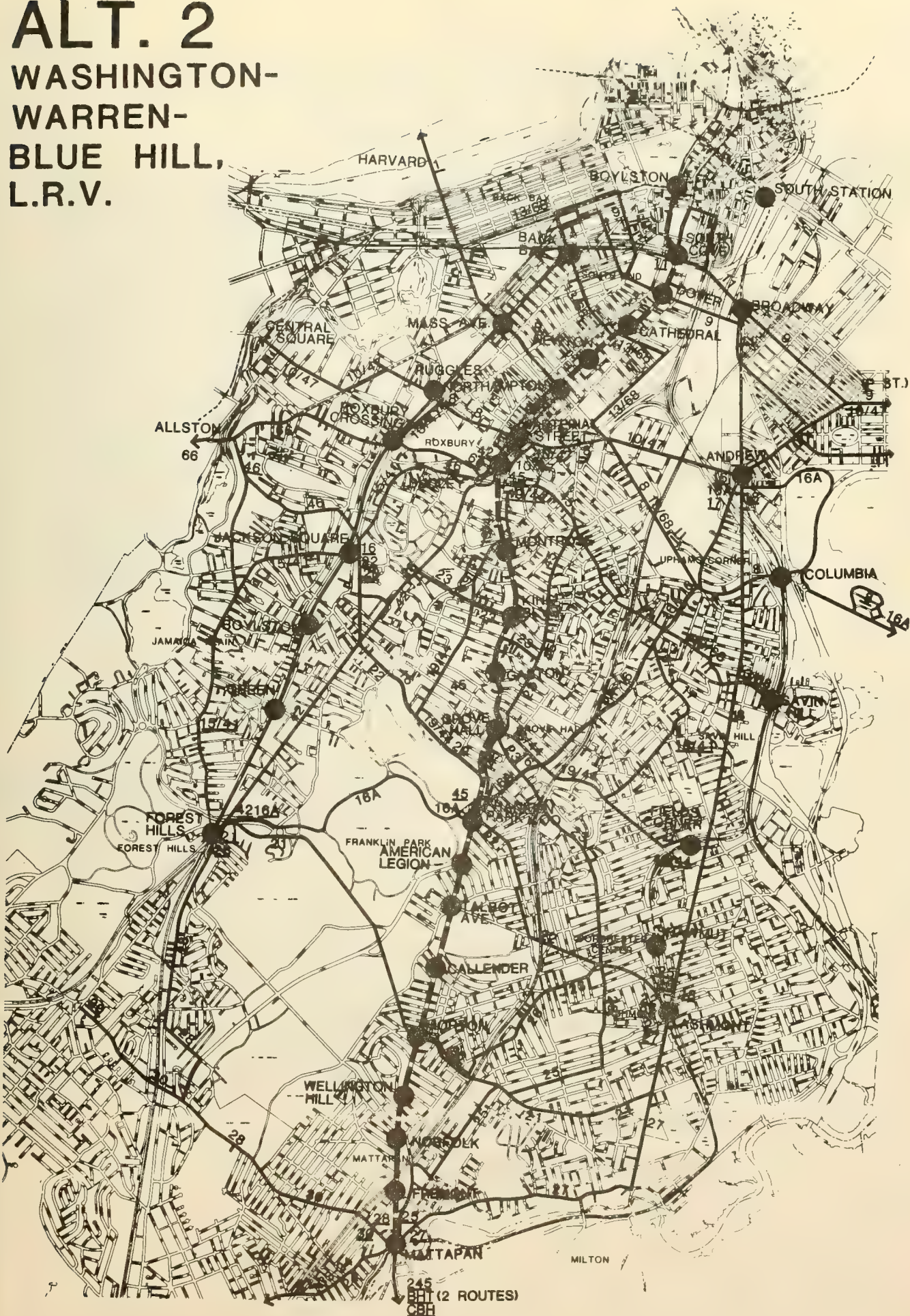


FIGURE E.2

ALTERNATIVE 3 - WASHINGTON - DUDLEY - MIDLAND, LRV

Table 1 - Operating Characteristics

1. Boylston Street Station (Central Subway) to Mattapan Square: 7.2 Miles^a
2. Stations: 19 (not including Boylston or Mattapan Stations)^a

Average Spacing Between Stations:

Boylston to Dudley	.29 Miles
Dudley to Uphams	.30 Miles
Uphams to Mattapan	.44 Miles
3. Vertical Profile (Alternative Construction Assumptions):

Boylston to Dudley -	Street median with traffic signal priority
Dudley to Uphams -	Either tunnel or street median (requiring some property acquisition)
Uphams to Mattapan -	Midland Branch R.O.W. and Blue Hill Avenue median section north of Mattapan Square
4. Train Length: 2 Boeing LRV/Train at Peak Periods^b
5. Train Capacity: (160 Pass./LRV) (2 LRV/Train) = 320 Pass./Train^b
6. Assumed Average Operating Speed (mph)^c

	<u>Daily Average</u> (with Signal Priority)	<u>AM Inbound Peak</u> (.94 Peak Factor)
Boylston to Dudley	16	15
Dudley to Uphams		
(In Median)	16.5	15.5
(Tunnel)	20	20
Uphams to Mattapan	23	23
7. Headways (Inbound AM Peak Period)

Mattapan to Boylston Street: 5 Minutes^d
8. Average Station Dwell Time (Train Stopped in Station): 20 Seconds
9. Assumed to Turn Around at North Station

(Boylston to North Station, 10 m.p.h.)

Table 2

Bus Route Operating Characteristics for A.M. Peak Period^e

	Route	Route Length (one way in miles)	Headways (in minutes)	Operating Speed (mph w/o layover)
* 1	Harvard-Dudley	4.2	5	8
8	Columbia Point-Ruggles Station	3.4	15	11
9	City Point-Copley	3.5	8	10
10/47	City Point-Central Sq. via Dudley	9.3	10	10
* 11	City Point-Kneeland Street	3.4	7	10
13/68	Savin Hill-Copley	4.2	15	10
* 15/41	Dudley-Centre & Elliot	2.7	7	10
16	Andrew-Jackson Square	Eliminated**		
* 16A	U. Mass.-Forest Hills	6.2	25	12
17	Fields Corner-Andrew	3.7	9	12
* 18	Ashmont-Andrew	4.6	30	14
19	Fields Corner-Jackson Square	3.5	15	11
* 21	Ashmont-Forest Hills	4.4	12	15
22	Ashmont-Jackson Square	3.6	6	11
* 23	Ashmont-Ruggles	4.5	5	11
25	Ashmont-Morton	2.4	12	10
* 26	Ashmont-Norfolk St.	1.9	7	11
* 27	Ashmont-Mattapan	2.3	30	12
* 28	Mattapan-Arborway	3.7	20	15
29	Mattapan-Columbia	3.5	10	13
* 30	Mattapan-Roslindale Square	2.7	20	13
42	Forest Hills-Dudley	2.7	12	10
43	Egleston-Stuart Street	Eliminated**		
* 44	Ruggles-Seaver Street	2.2	9	11
45	Ruggles-Talbot	3.5	9	11
46	Dudley-Heath & S. Huntington	2.0	30	12
48	Dudley-Boston State Hospital	Eliminated**		
* 49	Northampton-Kneeland Street	Eliminated**		
* 66	Dudley-Allston	4.0	5	10

* No alignment modifications made from proposed bus routes for Relocated Orange Line (Base Case II)

** Eliminated from proposed feeder bus network for Relocated Orange Line (Base Case II)

ALT. 3

WASHINGTON- DUDLEY- MIDLAND BRANCH, L.R.V.

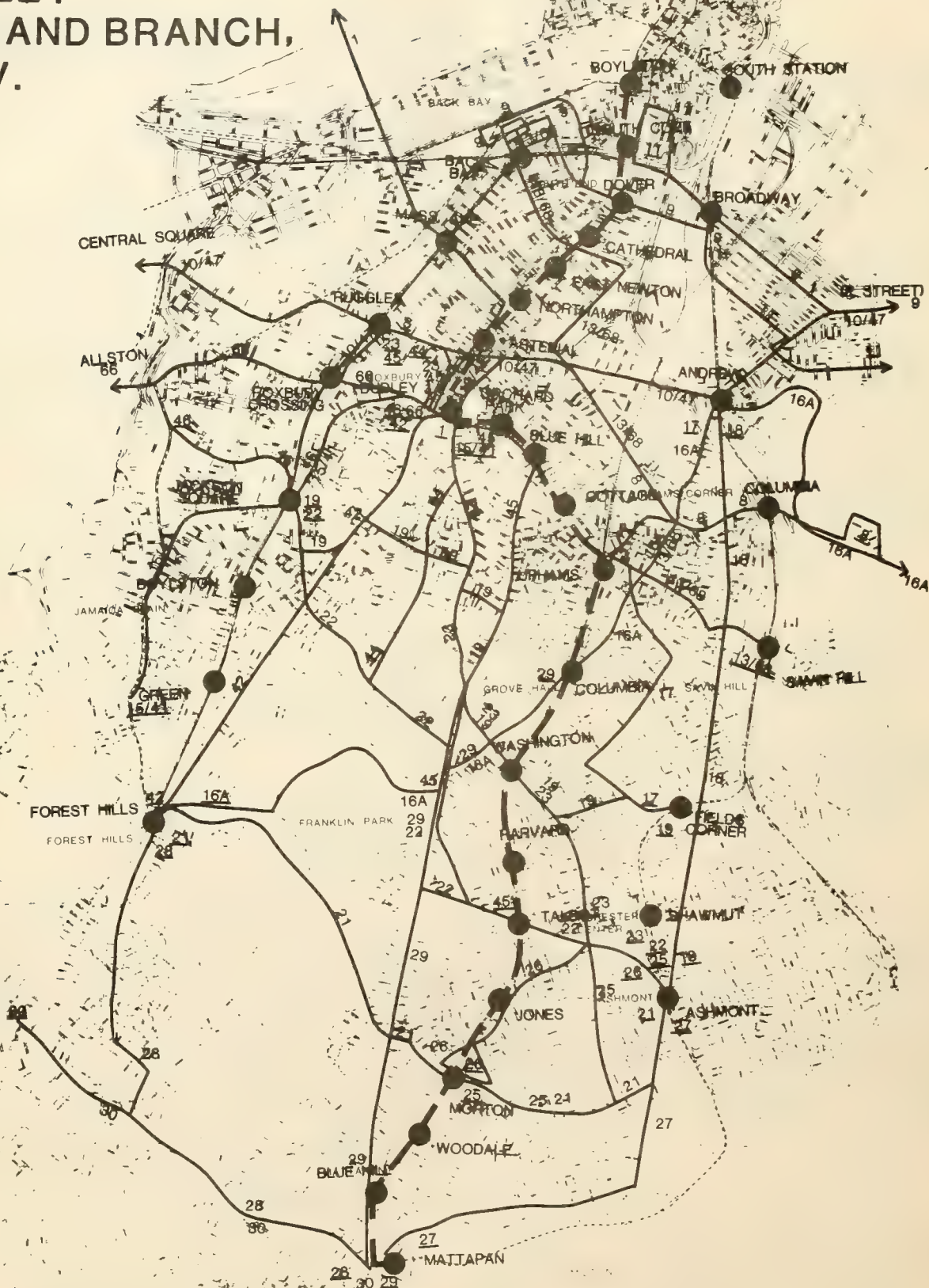


FIGURE E.3

ALTERNATIVE 4 - RUGGLES - DUDLEY - COLUMBIA POINT, LRV;
WASHINGTON - WARREN - BLUE HILL, LRV

Table 1 - Operating Characteristics
Washington - Warren - Blue Hill, LRV Radial Alignment

1. Boylston Street Station (Central Subway) to Mattapan Square: 6.45 Miles ^a
2. Stations: 19 (not including Boylston or Mattapan Stations) ^a

Average Spacing Between Stations:

Boylston to Dudley	.29 Miles
Dudley to Grove Hall	.37 Miles
Grove Hall to Mattapan	.33 Miles
3. Vertical Profile (Alternative Construction Assumptions);

Boylston to Dudley -	Street median with traffic priority
Dudley to Grove Hall -	Street median with traffic priority to Townsend Street. Tunnel construction south of Townsend Street to Grove Hall
Grove Hall to Mattapan -	Street median with traffic priority
4. Train Length: 2 Boeing LRV/Train ^b
5. Train Capacity: (160 Pass./LRV) (2 LRV/Train) = 320 Pass./Train ^b
6. Assumed Average Operating Speed (mph): ^c

	<u>Daily Average</u> <u>(with Signal Priority)</u>	<u>AM Inbound Peak</u> <u>(.94 Peak Factor)</u>
Boylston to Dudley	16	15
Dudley to Grove Hall		
Median Section	17.8	16.7
Tunnel Section	22.5	22.5
Grove Hall to Mattapan	16.7	15.7
7. Headways (Inbound AM Peak Period)

Mattapan to Boylston St.: 5 Minutes ^d
8. Average Station Dwell Time (Train Stopped in Station): 20 Seconds
9. Assumed to Turn Around at North Station (Boylston to North Station, 10 MPH)

Ruggles - Dudley - Columbia Point, LRV Crosstown Alignment

1. Huntington Avenue Green Line to Columbia Point Terminus: 4.17 Miles^a
Huntington Avenue Green Line to Columbia Station (Study Area Section): 3.26 Miles
2. Stations: 9 Stations in Study Area, Arterial and Dudley Stations, serve both this alignment and the radial alignment to Mattapan, plus two stations east of Columbia Station

Average Spacing Between Stations:

Huntington Avenue Green Line to Columbia Station
(All Study Area Stops) - .36 Miles
Columbia Station to UMass - .45 Miles

3. Vertical Profile (Alternative Construction Assumptions);

Huntington Avenue Green Line to Ruggles Station -	Either tunnel or at-grade
Ruggles Station to Arterial Station -	Arterial reservation
Arterial Station to Dudley -	Street Median
Dudley to Midland Branch -	Either tunnel or street median (requiring some property acquisition)
Midland Branch to Uphams Station -	Tunnel
Uphams Station to Columbia Station -	Street Median
Columbia Station to UMass -	Street Median

4. Train Length: 2 Boeing LRV/Train at Peak Periods^b
5. Train Capacity: (160 Pass./LRV) (2 LRV/Train) = 320 Pass./Train^b
6. Assumed Average Operating Speed (mph):^c

	<u>Daily Average</u> <u>(with Signal Priority)</u>	<u>AM Inbound Peak</u> <u>(.94 Peak Factor)</u>
Huntington Avenue Green Line to Ruggles Station		
(In Tunnel)	20	20
(At-Grade)	17	16
Ruggles Station to Arterial Station	20	19
Arterial Station to Dudley	16	15
Dudley to Uphams Station		
(In Tunnel)	20	20
(In Median)	16.5	15.5
Uphams Station to Columbia Station	18	17
Columbia Station to UMass	18	17

7. Headways (Inbound AM Peak Period)
Columbia Point to Huntington Avenue Green Line: 5 Minutes^d
8. Train assumed to turn around at Park Street Station
(Huntington Avenue Green Line to Park Street, 9 m.p.h.)

Table 2

Bus Route Operating Characteristics for A.M. Peak Period ^e

Route	<u>Route Length</u> (one way in miles)	<u>Headways</u> (in minutes)	<u>Operating Speed</u> (mph w/o layover)
1 Harvard-Dudley	4.2	5	8
8 Columbia Point-Ruggles Station	Eliminated **		
9 City Point-Copley	3.5	8	10
10/47 City Point-Central Sq. via Dudley	9.3	5	10
11 City Point-Kneeland	3.4	7	10
13/68 Savin Hill-Copley	4.2	15	10
15/41 Dudley-Centre & Elliot	2.6	7	10
16 Andrew-Jackson	4.3	12	11
16A U. Mass.-Forest Hills	Eliminated **		
17 Fields Corner-Andrew	3.3	9	12
18 Ashmont-Andrew	4.9	30	13
19/44 Fields Corner-Dudley	4.0	10	11
21 Ashmont-Forest Hills	4.4	12	15
22 Ashmont-Jackson Square	3.6	6	11
23 Ashmont-Jackson Square	4.0	5	11
25 Ashmont-Mattapan	3.0	12	10
26 Ashmont-Morton Station	2.0	7	11
27 Ashmont-Mattapan	2.3	30	12
28 Mattapan-Arborway	3.7	20	15
29 Mattapan-Egleston	Eliminated **		
30 Mattapan-Roslindale Square	2.7	20	13
42 Forest Hills-Dudley	2.7	12	10
43 Egleston-Dudley	Eliminated **		
45 Dudley- Franklin Park	2.4	10	11
46 Dudley-Heath & S. Huntington	2.9	30	12
48 Dudley-Boston State Hospital	Eliminated **		
49 Northampton-Kneeland Street	Eliminated **		
56 Dudley-Allston	4.0	5	10

* No alignment modifications made from proposed bus routes for Relocated Orange Line (Base Case II)

** Eliminated from proposed feeder bus network for Relocated Orange Line (Base Case II)

ALT. 4

RUGGLES-
DUDLEY- COLUMBIA
POINT, L.R.V.

WASHINGTON-
WARREN-
BLUE HILL, L.R.V.

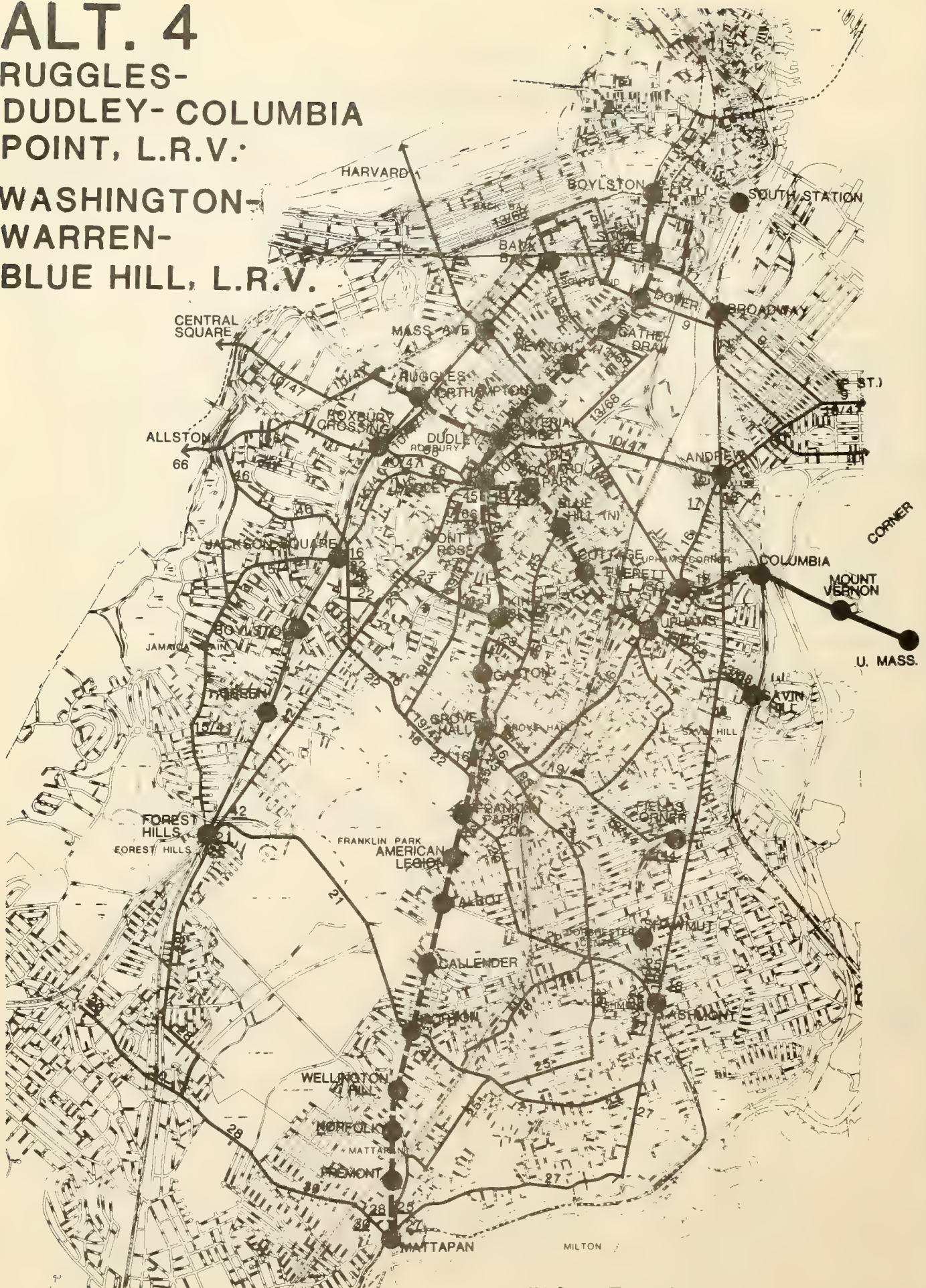


FIGURE E.4

7

ALTERNATIVE 5 - WASHINGTON TO DUDLEY, LRV;
RUGGLES STATION TO MATTAPAN, RAPID TRANSIT

Table 1 - Operating Characteristics
Ruggles Station to Mattapan, Rapid Transit Alignment

1. Ruggles Station (Orange Line) to Mattapan: 5.71 Miles^a
2. Stations: 9 (not including Ruggles Station)^a
Average Spacing Between Stations: .63 Miles
3. Vertical Profile (Alignment Construction Assumptions)^b:
 - Ruggles Station to Dudley Station - Tunnel
 - Dudley Station to Midland Branch - Tunnel
(via Dudley Street)
 - Midland Branch to Blue Hill Avenue - Existing Midland Right-of-Way
 - Blue Hill Avenue to Mattapan Square - Tunnel
4. Train Length: 4 Vehicles^b
5. Train Capacity: (210 Pass./Vehicle) (4 Vehicles/Train) = 840 Pass./Train^b
6. Assumed Average Operating Speed: 22 m.p.h. (Assumes operating speed as estimated for Relocated Orange Line)^c
7. Headways (Inbound A.M. Peak Period)
Mattapan to Ruggles Station: 4 Minutes^d
8. Average Station Dwell Time (Train Stopped in Station): 20 Seconds
9. Assumed to Turn Back at Oak Grove

Washington to Dudley, LRV Alignment

1. Boylston Street Station (Central Subway) to Dudley: 2.03 Miles^a
2. Stations: 7 (not including Boylston Station)^a
Average Spacing Between Stations:
Boylston to Dudley - .29 Miles
3. Vertical Profile (Alternative Construction Assumptions)
Boylston to Dudley - Primarily along street median with traffic signal priority. Tunnel section assumed south of Boylston Station to Marginal Street and Shawmut Avenue intersection
4. Train Length: 2 Boeing LRV/Train at Peak Periods^b
5. Train Capacity:^b (160 Pass./LRV) (2 LRV/Train) = 320 Passengers/Train
6. Assumed Average Operating Speed (m.p.h.)^c:

	<u>Daily Average</u> <u>(with Signal Priority)</u>	<u>AM Inbound Peak</u> <u>(.94 Peak Factor)</u>
Boylston to Dudley	16	15
7. Headways (Inbound AM Peak Period):
Dudley to Boylston: 5 Minutes^d
8. Average Station Dwell Time (Train Stopped in Station): 20 Seconds
9. Assumed to Turn Around at North Station (Boylston to North Station, 10 m.p.h.)

Table 2

Bus Route Operating Characteristics for A.M. Peak Period^e

Route	Route Length (one way in miles)	Headways (in minutes)	Operating Speed (mph w/o layover)
* 1 Harvard-Dudley	4.2	5	8
8 Columbia Point-Dudley	3.4	15	9
9 City Point-Copley	3.5	8	10
10/47 City Point-Central Sq. via Dudley	9.3	10	10
*11 City Point-Kneeland	3.4	7	10
13/68 Savin Hill-Copley	4.2	15	10
*15/41 Kane Square-Centre & Elliot	4.5	7	10
16 Andrew-Jackson	Eliminated **		
16A U. Mass.-Jackson	6.0	12	11
17 Fields Corner-Andrew	3.7	9	12
*18 Ashmont-Andrew	4.6	30	14
19 Fields Corner-Jackson	3.5	15	11
21 Ashmont-Morton Station	1.7	12	15
22 Ashmont-Jackson Square	3.6	6	11
*23 Ashmont-Ruggles	4.5	5	11
25 Ashmont-Morton Station	1.9	12	10
26 Ashmont-Morton Station	2.0	7	11
*27 Ashmont-Mattapan	2.3	30	12
*28 Mattapan-Arborway	3.7	20	15
29 Mattapan-Columbia	3.5	10	15
*30 Mattapan-Roslindale Square	2.7	20	13
42 Forest Hills-Dudley	2.7	12	10
43 Egleston-Dudley	Eliminated **		
44 Dudley-Seaver Street	1.5	9	11
45 Dudley-Talbot Station	3.1	10	11
46 Dudley-Heath & S. Huntington	2.0	30	12
48 Dudley-Boston State Hospital	Eliminated **		
*49 Northampton-Kneeland Street	Eliminated **		
*66 Dudley-Allston	4.0	5	10

* No alignment modifications made from proposed bus routes for Relocated Orange Line (Base Case II)

** Eliminated from proposed feeder bus network for Relocated Orange Line (Base Case II)

ALT. 5

WASHINGTON TO DUDLEY,
L.R.V.;

RUGGLES STATION TO MATTAPAN, RAPID TRANSIT

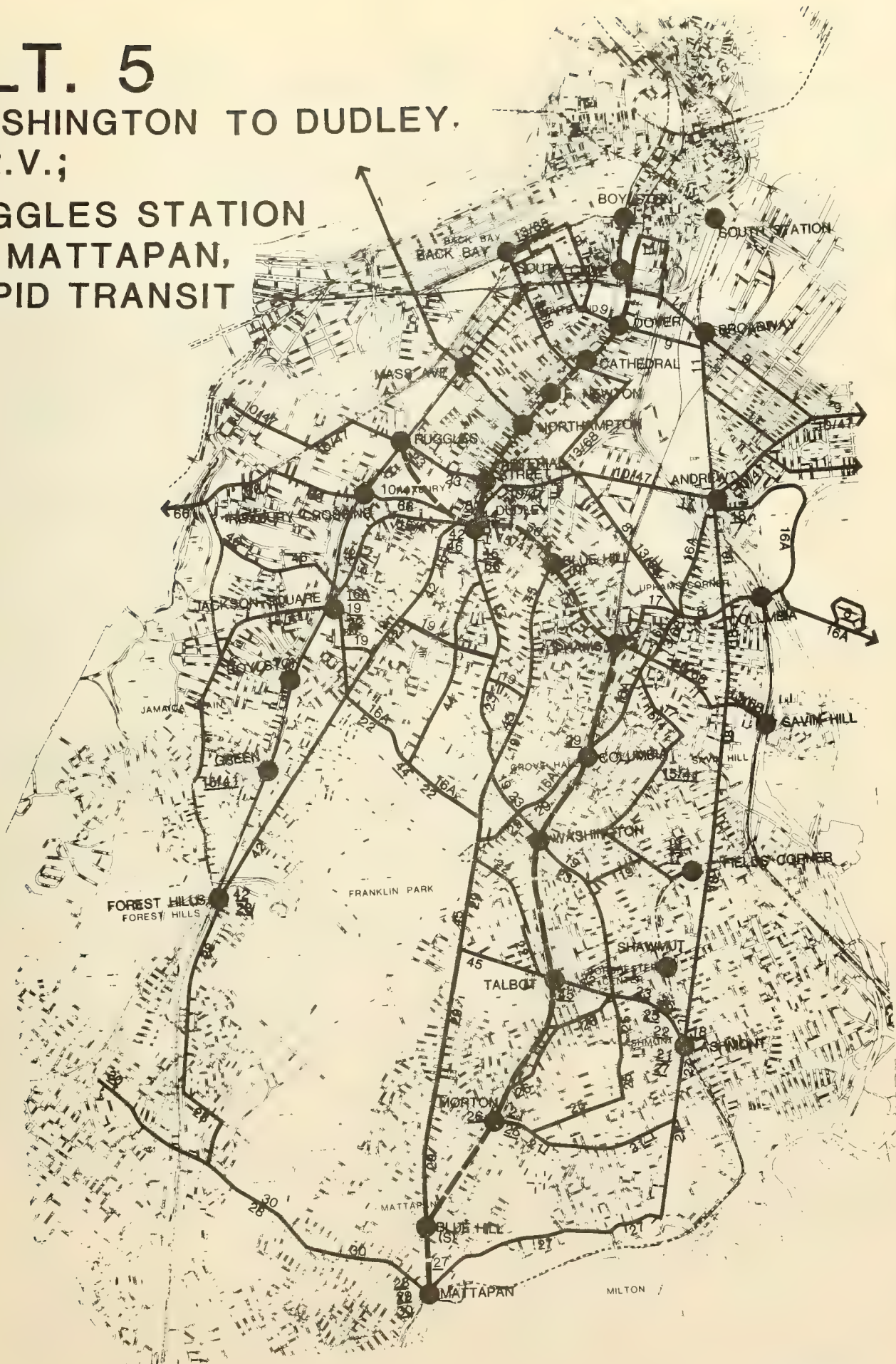


FIGURE E.5

Table 1 - Operating Characteristics

1. Kneeland Street to Mattapan Square Busway: 6.4 Miles
Class B Type Busway - service comparable to light rail service with special right-of-way arterial median with at-grade intersections. Class B Busway examples: Red Arrow Busway (Philadelphia), Runcorn (England), East Patways (Pittsburgh) - proposed, East-West Transitway (Milwaukee) - proposed
2. Stations: Assumes 20 on-line parallel platforms spaced comparably with Light Rail Alternative 2
 - Station bus berth width 10'; passenger platform width 6'
 - Station length 80 to 100' for two bus berths
3. Median Requirements (minimum):
 - Without Station
 - two 12' lanes, two 4' barriers - 32' total
 - With Station
 - two 12' lanes, 10' bus berth width, 6' passenger platform with curb barrier, 2' non-station side barrier - 42' total
4. Downtown Distribution: Combination of bus lanes and streets north of Kneeland Street providing transit loop (ARZ Report, BRA)
5. Number of Bus Movements on Exclusive Lanes in Other Cities

New Orleans - Canal St.*	40-50 Buses/Hr.
Chicago - Washington St.*	90 Buses/Hr.
New York City - Hillside Ave.**	170 Buses/Hr.

 - * median
 - ** curb lane
6. Assumed Average Operating Speed (Based on preliminary traffic circulation analysis by TAMS staff):
 - Downtown Transit Loop - 5 mph
 - Busway - 15 mph

Table 2

Bus Route Operating Characteristics for AM Peak Period

	Route	Route Length (One way in miles)	Headways (In minutes)	Operating Speed (mph w/o layover)
1	Harvard-Dudley	4.2	5	8
8	Columbia Point-Ruggles	4.0	15	11
9	City Point-Copley	3.5	8	10
10/47	City Point-Central Sq. via Dudley	9.3	10	10
11	City Point-Downtown Bus Loop	4.6	7	9
13/68	Savin Hill-Copley	4.2	15	10
15/41	Kane Square-Centre & Eliot	4.5	7	10
16	Andrew-Jackson Square	4.3	12	11
16A	U. Mass.-Forest Hills	6.2	25	12
17	Fields Corner-Andrew	3.3	9	12
18	Ashmont-Andrew	4.6	30	14
19	Fields Corner-Ruggles	4.4	10	13
21	Ashmont-Forest Hills	4.4	12	15
22	Ashmont-Downtown Bus Loop	6.8	5	13
N22	Ashmont-Brookline Village	5.0	5	13
23	Ashmont-Downtown Bus Loop	6.6	5	12
N23	Ashmont-Copley	6.0	5	13
25	Ashmont-Mattapan	3.0	12	10
26	Ashmont-Morton & Blue Hill	2.0	7	11
27	Ashmont-Mattapan	2.3	30	12
28	Mattapan-Arborway	3.7	20	15
29	Mattapan-Jackson Square	4.2	5	14
N29	Mattapan-Downtown Bus Loop	7.5	3	14
30	Mattapan-Roslindale Square	2.7	20	13
42	Forest Hills-Downtown Bus Loop	5.5	10	11
43	Egleston-Stuart Street	Eliminated from Relocated Orange Line bus network		
44	Seaver Street-Downtown Bus Loop	4.5	7	12
N44	Seaver Street-Copley	3.9	7	11
45	Franklin Park-Downtown Bus Loop	5.1	6	11
46	Dudley-Heath & S. Huntington	2.0	30	12
48	Dudley-Boston State Hospital	Eliminated from Relocated Orange Line bus network		
49	Northampton-Kneeland Street	Eliminated from Relocated Orange Line bus network		
66	Dudley-Allston	4.0	5	10

* No alignment modifications made from proposed bus routes for Relocated Orange Line (Base Case II)

** Bus routes which use Busway for portion of route length with assumed operating speed of 15 mph for Busway segment

ALT. 6

WASHINGTON - WARREN- BLUE HILL, BUSWAY

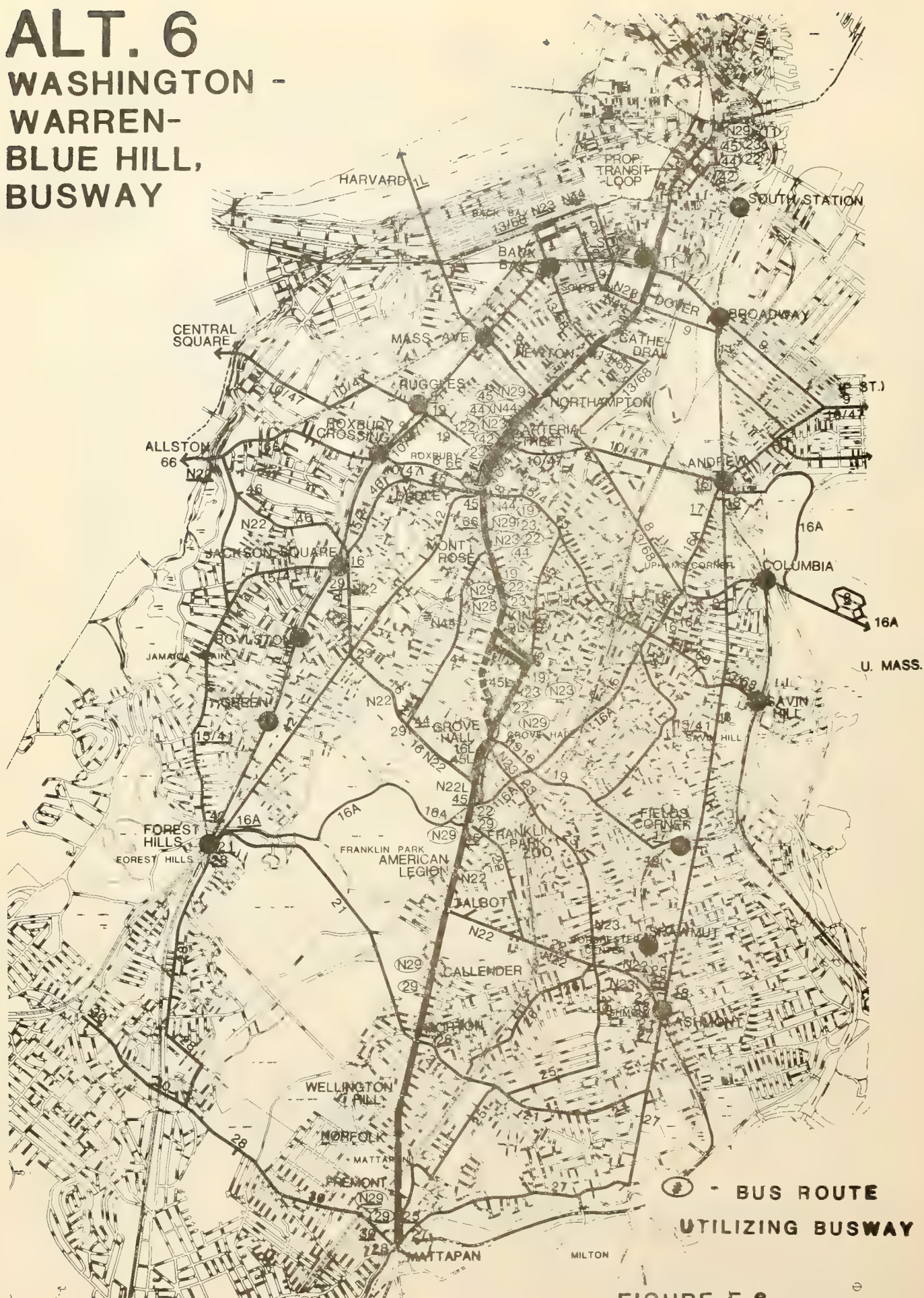


FIGURE E.6

ALTERNATIVE 7 - MIDLAND COMMUTER RAIL; WASHINGTON-WARREN
(TO MT. BOWDOIN), LRV

Table 1 - Operating Characteristics

Washington - Warren (To Mt. Bowdoin), LRV Alignment

1. Boylston Street Station (Central Subway) to Mt. Bowdoin: 3.90 miles^a

2. Stations: 12 (not including Boylston Station)^a

Average Spacing between Stations:

Boylston to Dudley	.29 miles
Dudley to Mt. Bowdoin	.37 miles

3. Vertical Profile (Alternative Construction Assumptions):

Boylston to Dudley - Street median with traffic signal priority

Dudley to Mt. Bowdoin - Street median with traffic signal priority
to Townsend Street. Tunnel construction
south of Townsend Street to Mt. Bowdoin

4. Train Length: 2 Boeing LRV/Train at Peak Periods^b

5. Train Capacity: (160 Pass./LRV) (2 LRV/Train) = 320 Pass./Train^b

6. Assumed Average Operating Speed (m.p.h.)^c

	<u>Daily Average</u> <u>(with Signal Priority)</u>	<u>AM Inbound Peak</u> <u>(.94 Peak Factor)</u>
Boylston to Dudley	16	15
Dudley to Mt. Bowdoin		
(Median Section)	17.8	16.7
(Tunnel Section)	22.5	22.5

7. Headways (Inbound AM Peak Period)

Mattapan to Boylston: 5 Minutes^d

8. Average Station Dwell Time (Train Stopped in Station): 20 Seconds

9. Assumed to Turn Around at North Station

(Boylston Station to North Station, 10 m.p.h.)

Table 1 (cont'd)

Midland Commuter Rail Operating Alignment

1. South Station to Readville Terminus: 9.31 Miles ^a
South Station to Blue Hill Avenue (Study Area Section): 5.93 Miles
2. Stations: 6 Stations in Study Area (not including South Station) ^a
Plus Stations at River Street, Fairmount and Readville

Average Spacing Between Stations:

South Station to Uphams Corner (first stop)	2.20 Miles
Uphams Corner to Blue Hill (All Study Area Stops)	.75 Miles
Blue Hill to Readville (South of Study Area)	1.13 Miles
3. Track Profile (Construction Assumptions):
Assumes profile of rehabilitated Midland Branch
4. Vehicle Technology:
Assume: Rail Diesel Coach (RDC) similar to new Budd
(SBV-2000) vehicle
5. Vehicle Capacity: Approximately 80 seats/vehicle
6. Assumed Average Operating Speed (m.p.h.) ^c

South Station to Uphams Corner	- 30
Uphams Corner to Blue Hill	- 17
Blue Hill to Readville	- 22
7. Headways (Inbound AM Peak Period)
Readville to South Station: 15 Minutes ^d
8. Assumed to Turn Back at Readville and South Station

Table 2

Bus Route Operating Characteristics for A.M. Peak Period^e

Route	Route Length (one way in miles)	Headways (in minutes)	Operating Speed (mph w/o layover)
1 Harvard-Dudley	4.2	5	8
8 Columbia Point-Ruggles Station	3.4	15	11
9 City Point-Copley	3.5	8	10
0/47 City Point-Central Sq. via Dudley	9.3	10	10
1 City Point-Kneeland	3.4	7	10
3/68 Savin Hill-Copley	4.2	15	10
5/41 Kane Square-Centre & Elliot	4.7	7	10
6 Andrew-Jackson	4.3	12	11
6A U. Mass.-Forest Hills	6.2	25	12
7 Fields Corner-Andrew	3.3	9	12
8 Ashmont-Andrew	4.0	30	14
9/44 Fields Corner-Dudley	4.0	10	11
1 Ashmont-Forest Hills	4.4	12	15
2 Ashmont-Jackson Square	4.4	6	11
3 Ashmont-Jackson Square	3.6	5	11
5 Ashmont-Mattapan	3.0	12	10
6 Ashmont-Morton Station	1.7	7	11
7 Ashmont-Mattapan	2.3	30	12
8 Mattapan-Arborway	3.7	20	15
9 Mattapan-Grove Hall	3.0	5	15
0 Mattapan-Roslindale Square	2.7	20	13
2 Forest Hills-Dudley	2.7	12	10
3 Egleston-Dudley	Eliminated**		
5 Dudley-Franklin Park	2.4	10	11
6 Dudley-Heath & S. Huntington	2.0	30	12
8 Dudley-Boston State Hospital	Eliminated**		
9 Northampton-Kneeland Street	Eliminated**		
6 Dudley-Allston	4.0	5	10

* No alignment modifications made from proposed bus routes for Relocated Orange Line (Base Case II)

** Eliminated from proposed feeder bus network, for Relocated Orange Line (Base Case II)

ALT. 7 MIDLAND COMMUTER RAIL(—)

WASHINGTON-
WARREN
(TO MT. BOWDOIN
L.R.V. (---))

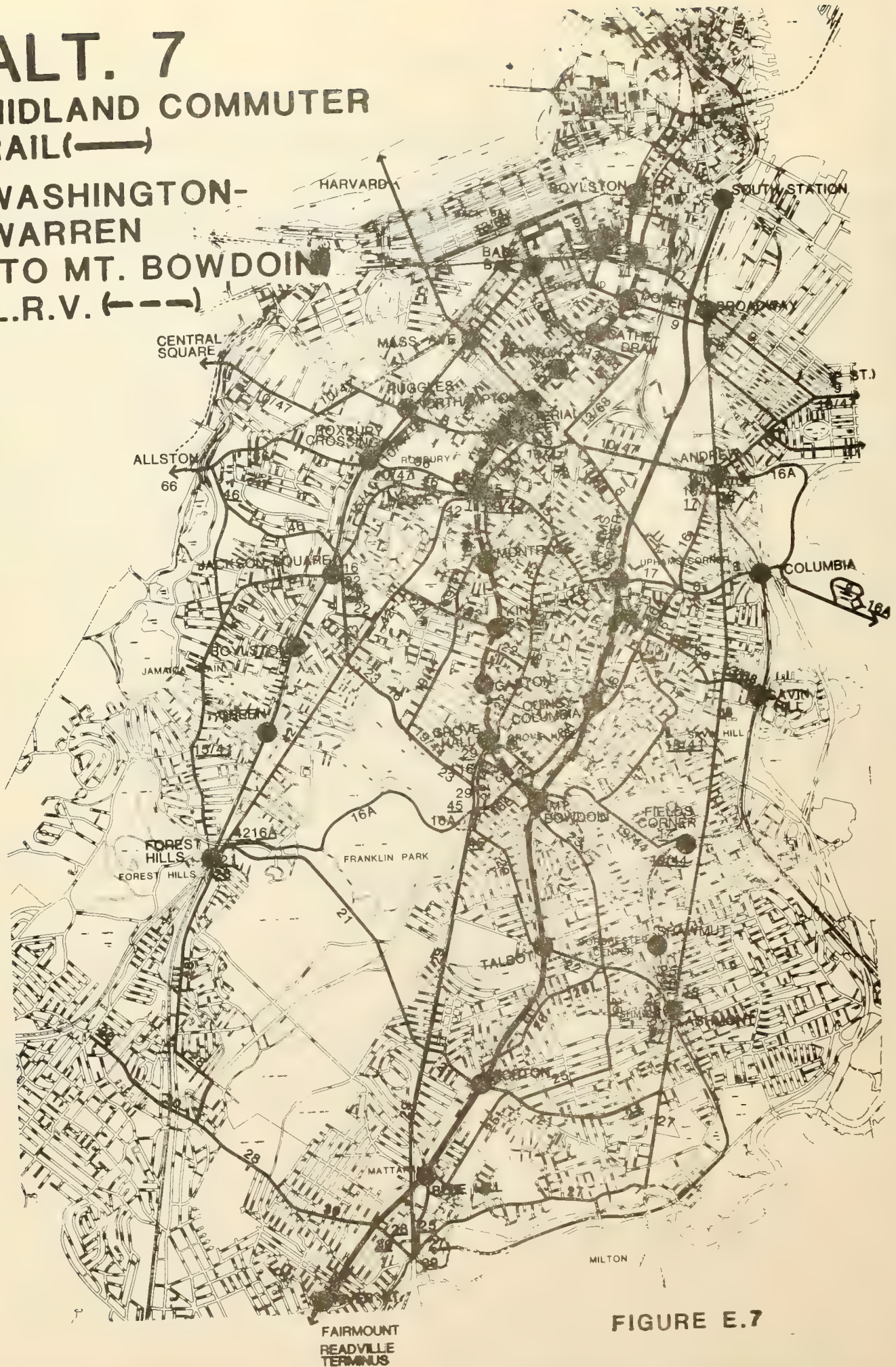


FIGURE E.7

7

ALTERNATIVE 8 - WASHINGTON-WARREN-BLUE HILL, RAPID TRANSIT

Table 1 - Operating Characteristics

1. Essex Station (Orange Line) to Mattapan Square: 6.64 Miles ^a
2. Stations: 12 (not including Essex Station) ^a
Average Spacing Between Stations: .55 Miles
3. Grade Separated in Tunnel
4. Train Length: 4 (#12 Vehicles) ^b
5. Train Capacity: (210 Pass./Vehicle) (4 Vehicles/Train) = 840 Pass./Train ^b
6. Assumed Average Operating Speed: 22 m.p.h. (Assumes operating speed as estimated for Relocated Orange Line) ^c
7. Headways (Inbound AM Peak Period) ^d
Mattapan to Essex Station: 4 Minutes
8. Average Station Dwell Time (Train Stopped in Station): 20 Seconds
9. Assumed to Turn Back at Oak Grove

Table 2

Bus Route Operating Characteristics for A.M. Peak Period^e

	Route	Route Length (one way in miles)	Headways (in minutes)	Operating Speed (mph w/o layover)
* 1	Harvard-Dudley	4.2	5	8
* 8	Columbia Point-Dudley	3.4	15	9
9	City Point-Copley	3.5	8	10
10/47	City Point-Central Sq. via Dudley	9.3	10	10
* 11	City Point-Kneeland Street	3.4	7	10
13/68	Savin Hill-Copley	4.0	15	10
* 15/41	Kane Square-Centre & Elliot Streets	4.5	7	10
16	Andrew-Jackson	4.3	12	11
* 16A	U. Mass.-Forest Hills	6.2	25	12
* 17	Fields Corner-Andrew	3.3	9	12
* 18	Ashmont-Andrew	4.6	30	14
19/44	Fields Corner-Dudley	4.0	10	11
21	Ashmont-Morton Station	1.9	12	15
22	Ashmont-Jackson Square	3.6	6	11
23	Ashmont-Jackson Square	4.0	5	11
25	Ashmont-Mattapan	3.0	12	10
26	Ashmont-Morton Station	2.0	7	11
* 27	Ashmont-Mattapan	2.3	30	12
* 28	Mattapan-Arborway	3.7	20	15
29	Mattapan-Grove Hall	3.0	10	12
* 30	Mattapan-Roslindale Square	2.7	20	13
42	Forest Hills-Dudley	2.7	12	10
43	Egleston-Stuart Street	Eliminated **		
45	Dudley-Grove Hall	2.0	10	11
46	Dudley-Heath & S. Huntington Streets	2.0	30	12
48	Dudley-Boston State Hospital	Eliminated **		
* 49	Northampton-Kneeland Street	Eliminated **		
66	Dudley-Allston	4.0	5	10

* No alignment modifications made from proposed bus routes for Relocated Orange Line (Base Case II)

** Eliminated from proposed feeder bus network for Relocated Orange Line (Base Case II)

ALT. 8

WASHINGTON- WARREN- BLUE HILL, RAPID TRANSIT

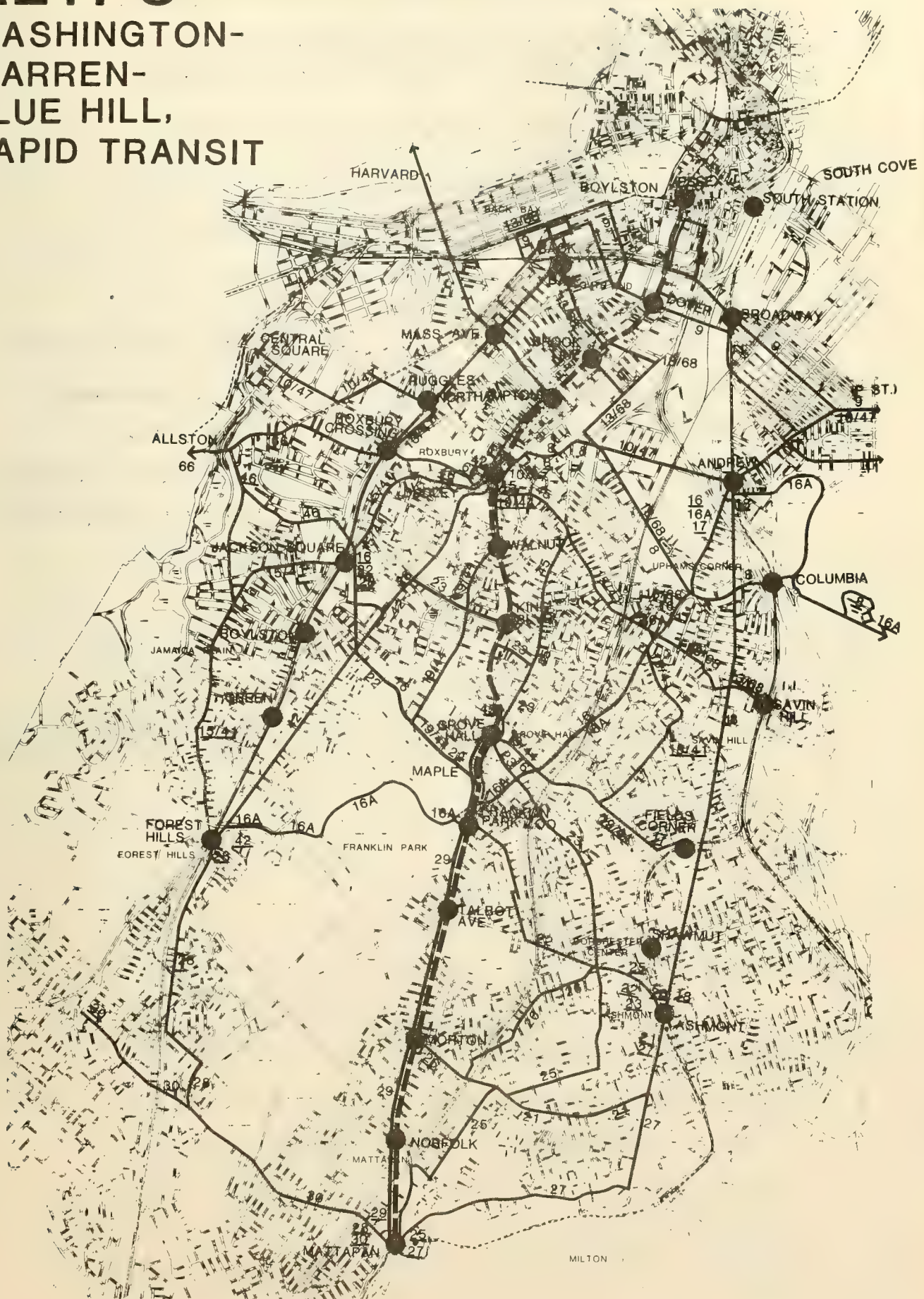


FIGURE E.8

ALTERNATIVE 9 - RUGGLES-DUDLEY-MIDLAND BRANCH, LRV;
DUDLEY-ARZ VIA WASHINGTON STREET, BUSWAY

Table 1 - Operating Characteristics
Ruggles-Dudley-Midland Branch, LRV Alignment

1. Huntington Avenue Green Line to Mattapan^a: 6.26 miles
2. Stations: 15 (not including Mattapan Station)
 Average Station Spacing: .40 miles (Table 2)
3. Vertical Profile (Alternative Construction Assumptions):

Huntington Avenue Green Line to Ruggles Station -	Either tunnel or at-grade
Ruggles Station to Arterial Station -	Arterial reservation
Arterial Station to Dudley -	Street median
Dudley to Midland Branch -	Either tunnel or at-grade
Midland Branch to Blue Hill (S) Station -	Midland Branch R.O.W.
Blue Hill (S) Station to Mattapan -	Street Median
4. Train Length: 2 Boeing LRV/Train at Peak Periods^b
5. Train Capacity: (160 Pass./LRV) (2 LRV/Train) = 320 Pass./Train^b
6. Assumed Average Operating Speed (mph):^c

	<u>Daily Average</u> <u>(with Signal Priority)</u>	<u>AM Inbound Peak</u> <u>(.94 Peak Factor)</u>
Huntington Avenue Green Line to Ruggles Station		
(In Tunnel)	20	20
(At-Grade)	17	16
Ruggles Station to Arterial Station	20	19
Arterial Station to Dudley	16	15
Dudley to Uphams Station		
(In Tunnel)	20	20
(In Median)	16.5	15.5
Uphams Station to Blue Hill (S)	23	23
Blue Hill (S) to Mattapan	17	16
7. Headways (Inbound AM Peak Period)

Mattapan to Huntington Ave. Green Line: 5 Minutes^d
8. Average Station Dwell Time (Train Stopped in Station): 20 Seconds
9. Assumed to Turn Around at Park Street Station
 (Huntington Avenue Green Line to Park Street, 9 m.p.h.)

Table 1 (cont'd)Dudley - ARZ via Washington Street, Busway Alignment

1. Kneeland Street to Dudley Busway: 2.0 Miles^a
 Class B Type Busway - service comparable to light rail service with special right-of-way arterial median with at-grade intersections.
 Class B Busway examples: Red Arrow Busway (Philadelphia), Runcorn (England), East Patways (Pittsburgh) - proposed, East-West Transitway (Milwaukee) - proposed
2. Stations: Assumes 12 on-line parallel stops spaced approximately 900 feet apart
 Station bus berth width 10; passenger platform width 6'
 Station length 80 to 100' for two bus berths
3. Median Requirements (minimum):
 Without Station
 - two 12' lanes, two 4' barriers - 32' total
 With Station
 - two 12' lanes, 10' bus berth width, 6' passenger platform with curb barrier, 2' non-station side barrier - 42' total
4. Downtown Distribution: Combination of bus lanes and streets north of Kneeland Street providing transit loop (ARZ Report, BRA)
5. Number of Bus Movements on Exclusive Lanes in Other Cities:

New Orleans - Canal St.*	40-50 Buses/Hr.
Chicago - Washington St.*	90 Buses/Hr.
New York City - Hillside Ave.**	170 Buses/Hr.

 * median
 ** curb lane
6. Assumed Average Operating Speed (mph):
 Downtown Transit Loop - 5 mph. (based on preliminary traffic circulation analysis by TAMS staff)
 Busway - 12 mph. (based on preliminary traffic circulation analysis by TAMS staff, which assumes bus priority at 10 signalized intersections)
7. Busway Level of Utilization at Peak Period (based on Alt. 9 - Table 2 assumptions):
 South of South Cove Station: 30 Vehicles/Hr.
 North of South Cove Station: 38 Vehicles/Hr.

Table 2

Bus Route Operating Characteristics for AM Peak Period ^e

	Route	Route Length (one way in miles)	Headways (in minutes)	Operating Speed (mph w/o layover)
* 1	Harvard-Dudley	4.2	5	8
	8/47 Columbia Pt. - Central Square via Dudley	7.6	10	9
9	City Point-Copley	3.5	8	10
* 10	City Point-Ruggles	3.6	10	10
11	City Point-ARZ	4.6	7	8
	13/68 Savin Hill-Copley	4.2	15	10
	15/41 Dudley-Centre & Elliot Streets	2.7	7	10
16	Andrew-Jackson	Eliminated **		
16A	U. Mass-Jackson	6.0	12	11
17	Fields Corner-Andrew	3.7	9	12
* 18	Ashmont-Andrew	4.6	30	14
19	Fields Corner-Jackson	3.5	15	11
* 21	Ashmont-Forest Hills	4.4	12	15
22	Ashmont-Jackson Square	3.6	6	11
* 23	Ashmont-Ruggles	4.5	5	11
25	Ashmont-Morton Station	1.9	12	10
* 26	Ashmont-Morton Station	2.0	7	11
* 27	Ashmont-Mattapan	2.3	30	12
* 28	Mattapan-Arborway	3.7	20	15
29	Mattapan-Columbia	3.5	10	15
* 30	Mattapan-Roslindale Square	2.7	20	13
42	Forest Hills-Dudley	2.7	12	10
43	Egleston-Dudley	Eliminated **		
44	Ruggles-Seaver Street	2.2	9	11
45	Ruggles-Talbot Station	3.5	10	11
46	Dudley-Heath & S. Huntington	2.0	30	12
48	Dudley-Boston State Hospital	Eliminated **		
* 49	Northampton-Kneeland Street	Eliminated **		
* 66	Dudley-Allston	4.0	5	10
	Shuttle Bus (Dudley-ARZ)	2.5	2	9.5

* No alignment modifications made from proposed bus routes
for Relocated Orange Line (Base Case II)

** Eliminated from proposed feeder bus network for relocated Orange Line (Base Case II)

ALT. 9

RUGGLES- DUDLEY- MIDLAND BRANCH, L.R.V.;

DUDLEY STATION VIA WASHINGTON STREET, BUS

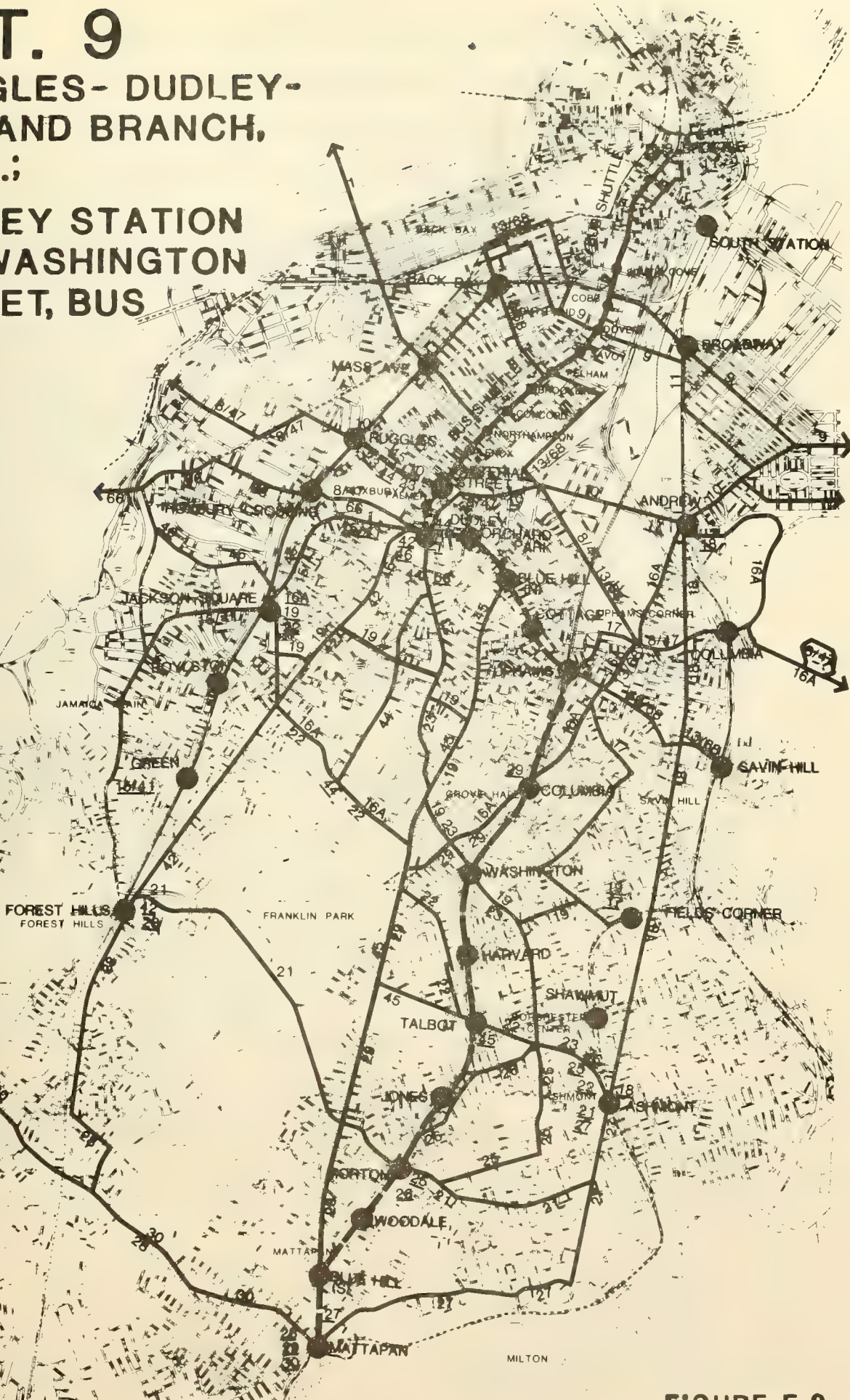


FIGURE E.9

ALTERNATIVE 10 - AUGMENTED FEEDER BUS

Alternative 10 assumes modifications of route alignment and headways of the feeder bus network as proposed for Base Case 2 - Relocated Orange Line. The modifications made of Base Case 2 to develop Alternative 10 include:

Alignment

- o Route 8 - Ruggles to Columbia Point and Route 47 - Andrew Station to Central Square now combined to provide service between Central Square and Columbia Point via Dudley and Uphams Corner.
- o Route 11 - City Point to Kneeland Street is extended into the Auto Restricted Zone (ARZ).
- o Route 13 - Savin Hill to Ruggles and Route 68 - Copley Square to BCH are combined to provide service between Copley Square and Savin Hill via BCH.
- o Route 15/41 - Centre & Eliot Streets to Kane Square is rerouted along New Dudley Street to provide access to Roxbury Crossing and route extended to Fields Corner from Kane Square.
- o Route 16 - Andrew to Jackson Square is rerouted along Geneva Avenue to provide direct service to Grove Hall.
- o Route 19 - Fields Corner to Ruggles is rerouted from Ruggles to Jackson Square via crosstown alignment along Martin Luther King Boulevard.
- o Route 23 - Ashmont to Ruggles is rerouted from Ruggles to Jackson Square via crosstown alignment along Martin Luther King Boulevard.
- o Route C29 - Mattapan to Ruggles via Dudley is a new route providing service between Mattapan and Dudley.
- o Route 42/49 - Forest Hills to Essex is extended into the Auto Restricted Zone (ARZ).
- o Route 43 - Jackson Square to Park Street is routed from Park Street to the Auto Restricted Zone (ARZ).

Headway

The following routes have modified headways from headway assumptions for Base Case 2.

	<u>Base Case 2 Headway</u>	<u>Alternative 10</u>
8/47 Central Square-Columbia Point	15	5
13/68 Savin Hill to Copley	15	10
19 Jackson Square to Fields Corner	10	5
22 Ruggles to Ashmont	6	5
29 Mattapan to Egleston	9	5
42/49 Forest Hills to ARZ via Dudley	12	5
43 Egleston to ARZ	10	5
44 Seaver Street to Ruggles	9	5
45 Franklin Park to Ruggles	9	5
46 Heath & S. Huntington to Dudley	30	10

Table 1
Augmented Feeder Bus Operating Characteristics for
AM Peak Period^e

	Route	Route Length (One way in miles)	Headways (In Minutes)	Operating Speed (mph w/o layover)
1	Harvard-Dudley	4.2	5	8
8/47	Columbia Point-Central Square via Dudley and Uphams Corner	7.5	5	9
9	Copley-City Point	3.5	8	10
10	City Point-Ruggles	3.6	10	10
11	City Point-ARZ	4.5	7	9
13/68	Savin Hill-Copley	4.2	10 ^C	10
15/41	Centre & Elliot Streets - Fields Corner via Dudley	5.5	8	10
16	Andrew-Jackson Square via Grove Hall	4.3	12	10
16A	Forest Hills-U. Mass.	6.2	24	12
17	Fields Corner-Andrew	3.3	9	12
18	Ashmont-Andrew	4.6	30	14
19	Jackson Square-Fields Corner	3.1	5	11
21	Ashmont-Forest Hills	4.4	12	15
22	Ruggles-Ashmont via Dudley	4.7	5	11
23	Jackson Square-Ashmont	4.0	5	11
25	Ashmont-Mattapan	3.0	12	10
26	Ashmont-Norfolk Street	2.0	7	11
27	Ashmont-Mattapan	2.3	30	12
28	Mattapan-Arborway	3.7	20	15
29	Mattapan-Jackson Square	4.1	5	13
29	Mattapan-Ruggles via Dudley	5.2	5	12
30	Mattapan-Roslindale Square	2.7	12	13
42/49	Forest Hills-ARZ via Dudley	5.5	5	8
43	Egleston-ARZ	4.5	5	9
44	Seaver Street-Ruggles via Dudley	2.3	5	11
45	Franklin Park-Ruggles via Dudley	3.2	5	10
46	Heath & S. Huntington-Dudley	2.0	10	12
48	Dudley-Boston State Hospital	Eliminated **		
66	Dudley-Allston	4.0	5	10

* No alignment modification made from proposed bus routes for Relocated Orange Line (Base Case II)

** Eliminated from proposed feeder bus network for Relocated Orange Line (Base Case II)

ALT. 10

AUGMENTED FEEDER BUS LINES

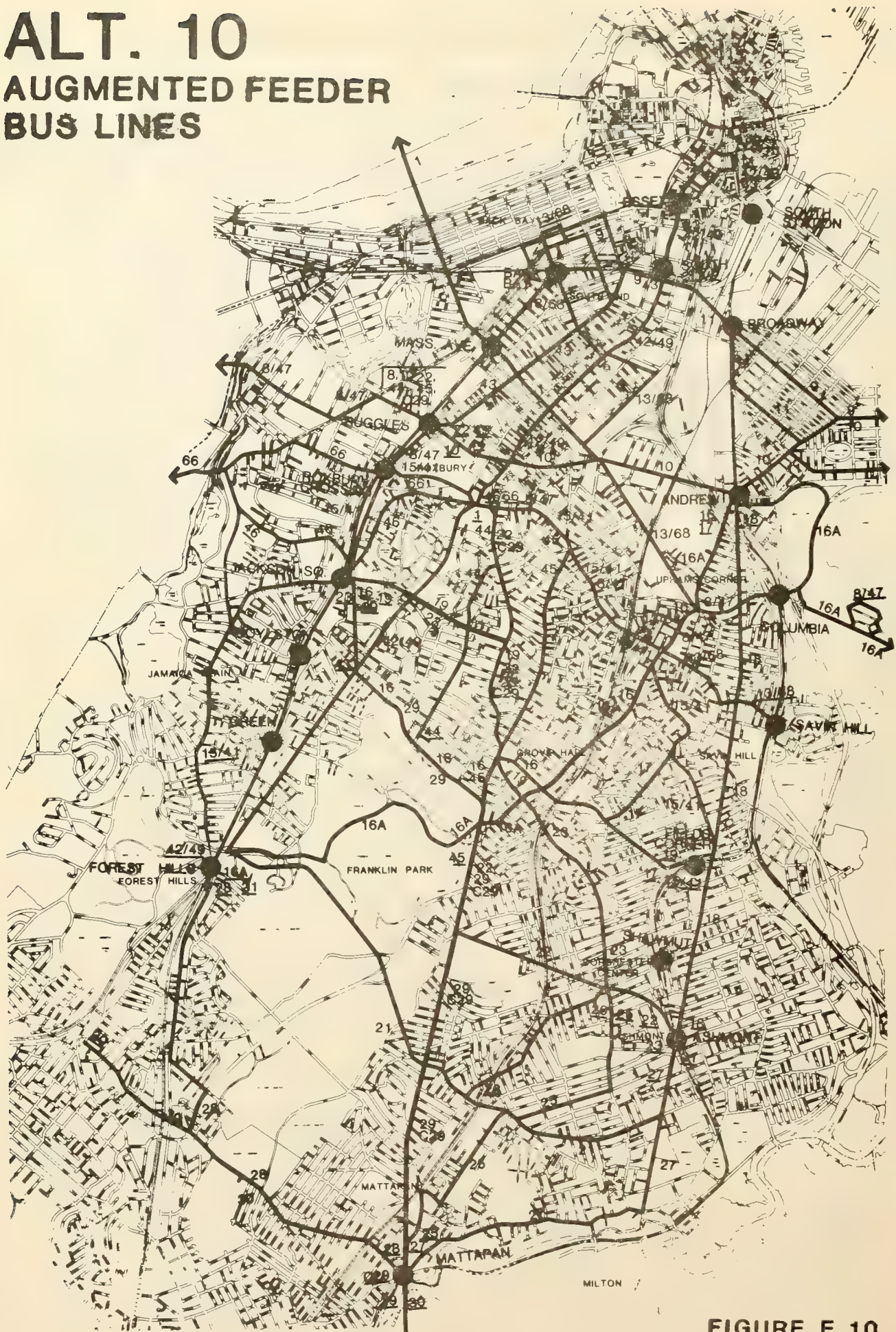


FIGURE E.10

ALTERNATIVE 11 - WASHINGTON-WARRENT-BLUE HILL, RAPID TRANSIT; RUGGLES-
DUDLEY-COLUMBIA POINT, LRV CROSSTOWN ALIGNMENT; DUDLEY-EGLESTON-
FRANKLIN PARK ZOO-UPHAMS CORNER-COLUMBIA POINT, LRV CROSSTOWN
ALIGNMENT

Table 1 - Operating Characteristics

Washington-Warren-Blue Hill, Rapid Transit Alignment

1. Essex Station (Orange Line) to Mattapan Square: 6.64 Miles^a
2. Stations: 12 (not including Essex Station)^a
Average Spacing Between Stations: .55 Miles
3. Grade Separated in Tunnel
4. Train Length: 4 (#12 Vehicles)^b
5. Train Capacity: (210 Pass./Vehicle) (4 Vehicles/Train) = 840 Pass. Train^b
6. Assumed Average Operating Speed: 22 m.p.h. (Assumes operating speed as estimated for Relocated Orange Line)^c
7. Headways (Inbound AM Peak Period)^d
Mattapan to Essex Station: 4 Minutes
8. Average Station Dwell Time (Train Stopped in Station): 20 Seconds
9. Assumed to Turn Back at Oak Grove

Table 1 (cont'd)

Ruggles - Dudley - Columbia Point, LRV Crosstown Alignment

1. Huntington Avenue Green Line to Columbia Point Terminus: 4.17 Miles ^a
Huntington Avenue Green Line to Columbia Station (Study Area Section):
3.26 Miles
2. Stations: 9 Stations in Study Area plus two stations east of Columbia Station; Dudley Station serves all three alignments; stations from Uphams Comer to Columbia Point serve both crosstown alignments

Average Spacing Between Stations:
Huntington Avenue Green Line to Columbia Station .36 Miles
(All Study Area Stops) -
Columbia Station to UMass - .45 Miles
3. Vertical Profile (Alternative Construction Assumptions):

Huntington Avenue Green Line to Ruggles Station -	Either tunnel or at-grade
Ruggles Station to Arterial Station -	Arterial Reservation
Arterial Station to Dudley -	Street Median
Dudley to Midland Branch -	Either tunnel or street median (requiring some property acquisition)
Midland Branch to Uphams Station -	Tunnel
Uphams Station to Columbia Station -	Street Median
Columbia Station to UMass -	Street Median
4. Train Length: 2 Boeing LRV/Train at Peak Periods ^b
5. Train Capacity: (160 Pass./LRV) (2 LRV/Train) = 320 Pass./Train ^b
6. Assumed Average Operating Speed (mph): ^c

	<u>Daily Average</u> (with signal priority)	<u>AM Inbound Peak</u> (.94 Peak Factor)
Huntington Avenue Green Line to Ruggles Station		
(In Tunnel)	20	20
(At-Grade)	17	16
Ruggles Station to Arterial Station	20	19
Arterial Station to Dudley	16	15
Dudley to Uphams Station		
(In Tunnel)	20	20
(In Median)	16.5	15.5
Uphams Station to Columbia Station	18	17
Columbia Station to UMass	18	17
7. Headways (Inbound AM Peak Period)
Columbia Point to Huntington Avenue Green Line: 5 Minutes ^d
8. Assumed to Turn Around at Park Street Station
(Huntington Avenue Green Line to Park Street, 9 m.p.h.)

Table 1 (cont'd)

Dudley - Egleston - Franklin Park Zoo - Uphams Corner -
Columbia Point, LRV Crosstown Alignment

1. Dudley to Uphams Corner via Franklin Park: 4.21 Miles ^a
Dudley to Columbia Point via Uphams Corner and Franklin Park: 5.86 Miles ^a
2. Stations: 13 (not including stations at Dudley and from Uphams Corner to Columbia Point which are served by one or more of the other alignments)
Average Station Spacing (Dudley to Uphams Corner): .30 Miles
3. Vertical Profile (Alternative Constructive Assumptions):

Dudley to Seaver Street - (via Washington Street)	Either tunnel or street median with transit priority
Seaver Street, Blue Hill Ave., Columbia Road to point just south of Uphams Corner -	Street median with transit priority
Tunnel section into Uphams Corner to connect with other crosstown alignment	
4. Train Length: 2 Boeing LRV/Train at Peak Periods ^b
5. Train Capacity: (160 Pass./LRV) (2 LRV/Train) = 320 Pass./Train ^b
6. Assumed Average Operating Speed (m.p.h.) ^c

	Daily Average (with Signal Priority)	AM Inbound Peak (.94 Peak Factor)
Dudley to Uphams Corner (via Franklin Park)	16	15
Uphams Corner to Columbia Point	18	17
7. Headways (Inbound AM Peak Period) ^d
Boylston to Mattapan: 5 Minutes
8. Average Station Dwell Time (Train Stopped in Station): 20 Seconds
9. Vehicles operating along this alignment are assumed to turn back at Dudley and Columbia Point. Vehicles for both crosstown alignments would operate together from Uphams Corner to Columbia Point.

Table 2

Bus Route Operating Characteristics for A.M. Peak Period^e

	Route	Route Length (one way in miles)	Headways (in minutes)	Operating Speed (mph w/o layover)
* 1	Harvard-Dudley	4.2	5	8
* 8	Columbia Point-Dudley	Eliminated **		
9	City Point-Copley	3.5	8	10
* 10	City Point - Ruggles Station	4.5	10	10
* 11	City Point-Kneeland Street	3.4	7	10
13/68	Savin Hill-Copley	4.0	15	10
15/41	Dudley-Centre & Elliot Streets	2.6	7	10
16	Andrew-Jackson	Eliminated **		
16A	U. Mass. - Forest Hills	Eliminated **		
* 17	Fields Corner-Andrew	3.3	9	12
* 18	Ashmont-Andrew	4.6	30	14
19/44	Fields Corner-Dudley	4.6	10	11
21	Ashmont - Forest Hills	3.8	12	15
22	Ashmont - Dudley Station	4.0	10	11
23	Ashmont - Jackson Square	4.0	5	11
25	Ashmont-Mattapan	3.0	12	10
26	Ashmont-Morton Station	2.0	7	11
* 27	Ashmont-Mattapan	2.3	30	12
* 28	Mattapan-Arborway	3.7	20	15
29	Mattapan-Franklin Park Zoo	2.7	10	12
* 30	Mattapan-Roslindale Square	2.7	20	13
42	Jackson Square-Franklin Park via Forest Hills	7.0	12	12
43	Egleston-Stuart Street	Eliminated **		
45	Dudley-Franklin Park Zoo	2.2	10	11
46	Dudley-Health & S. Huntington Streets	2.0	30	12
47	Central Square-Columbia Point	7.5	12	10
48	Dudley-Boston State Hospital	Eliminated **		
* 49	Northampton-Kneeland Street	Eliminated **		
66	Dudley-Allston	4.0	5	10

* No alignment modification made from proposed bus routes for Relocated Orange Line (Base Case II)

** Eliminated from proposed feeder bus network for Relocated Orange Line (Base Case II)

ALT. 11

WASHINGTON- WARREN- BLUE
HILL, RAPID TRANSIT;

RUGGLES- DUDLEY-
COLUMBIA POINT,
CROSSTOWN L.R.V.
ALIGNMENT;

DUDLEY- EGLESTON-
FRANKLIN PARK
ZOO-UPHAMS
CORNER-
COLUMBIA
POINT, L.R.V.
CROSSTOWN
ALIGNMENT

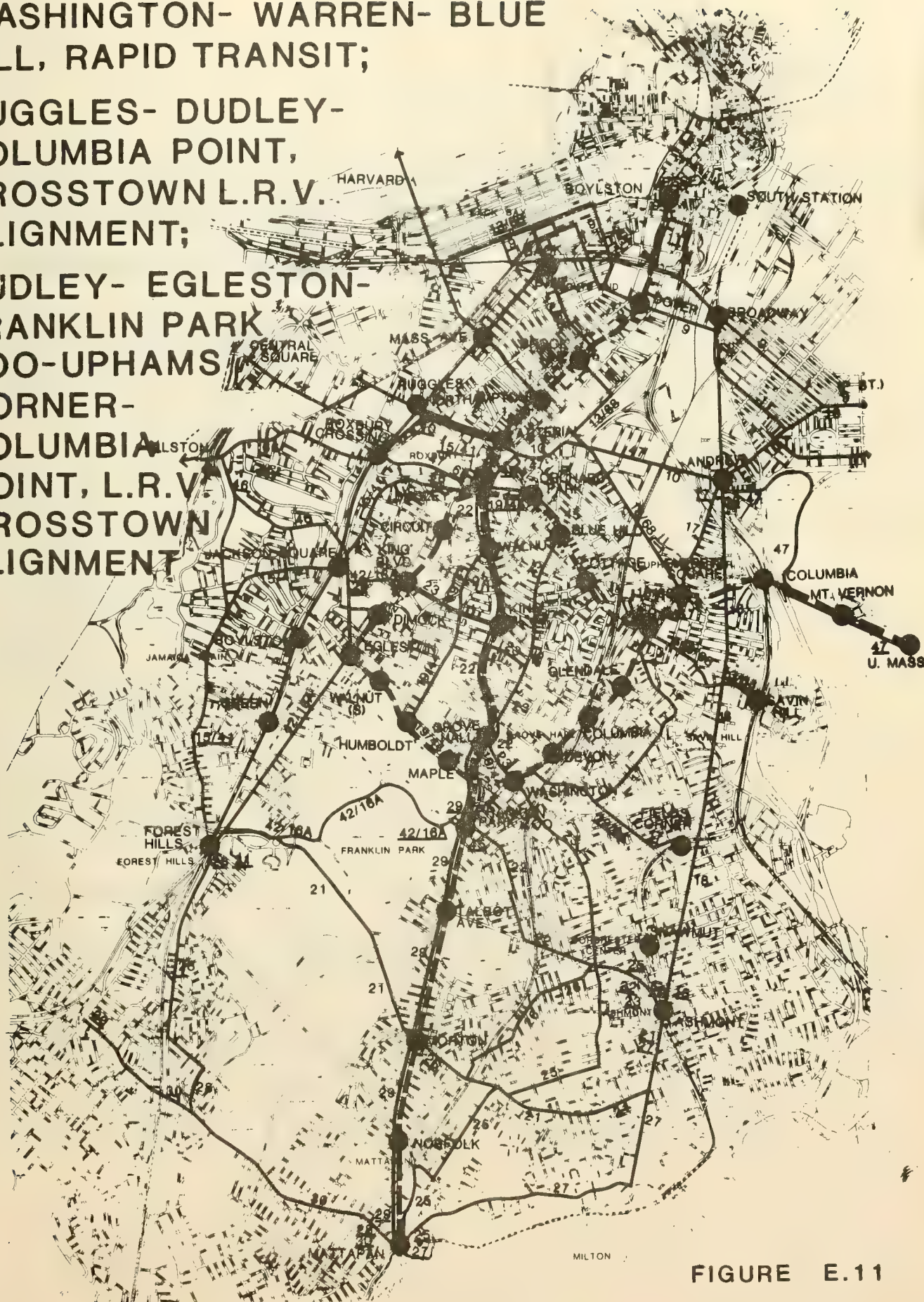


FIGURE E.11

NOTES

^aAlignment and Stations

- o Alternative 1 alignment and station locations north of Dudley and south of Franklin Park Zoo coincide with BTPR Southwest Report (Chapter III-B). Horizontal alignment and station locations south of Dudley and north of Franklin Park Zoo based on preliminary work developed by Study Team.
- o Alternative 2 alignment and station locations coincide with BTPR Southwest Report (Chapter III-B).
- o Alternative 3 alignment and station locations north of Dudley coincide with BTPR Southwest Report (Chapter III-B). Horizontal alignment and station locations south of Dudley based on preliminary work developed by Study Team.
- o Alternative 4 radial alignment assumes the Alternative 2 alignment. The crosstown alignment and station locations are based on preliminary work developed by the Study Team.
- o Alternative 5 LRV alignment and stations from Essex Station to Dudley coincide with BTPR Southwest Report (Chapter III-B). For rapid transit from Ruggles to Mattapan, the alignment and station locations south of Washington Street, Dorchester and Midland Branch primarily based on BTPR Southwest Report (Chapter III-B). Alignment and station locations between Dudley and Washington Street, Dorchester and Midland Branch based on preliminary work developed by Study Team.
- o Alternative 6 alignment and stations are identical to Alternative 2.
- o Alternative 7 LRV alignment and stations north of Grove Hall coincide with BTPR Southwest Report (Chapter III-B). Commuter rail stations on the Midland Branch are based on "Design Report for the Reconstruction of Dorchester Branch", Thomas K. Dyer, Inc., February, 1977.
- o Alternative 8 alignment and stations based on BTPR Southwest Report (Chapter III-B).
- o Alternative 9 alignment and stations for both LRV and bus components are suggested by the Program for Mass Transportation Report (PMT), Chapter 5, Southwest Corridor.
- o Alternative 11 LRV crosstown alignment on Washington Street, Seaver Street, and Columbia Road suggested by the Roxbury Caucus of the Southwest Corridor Coalition. The Essex Station to Mattapan rapid transit alignment and Ruggles Station to Columbia Point crosstown LRV alignment coincides with alignments for other alternatives.

^b Train Configurations

- o Alternatives utilizing LRV technology assume the Boeing SLRV operating in train configurations similar to planned MBTA LRV operations on other Green Line branches.
- o Alternatives utilizing rapid transit technology assume the Hawker-Siddeley (#12) vehicle (to be acquired in 1979) for the Orange Line operating under existing Orange Line train configurations.

^c Average Operating Speeds

- o Light rail technology operating speeds are based on "Light Rail Transit: State of the Art Review", DeLeuw, Cather and Company, 1976; and "Surface Car Line Operations Study: Beacon Street Surface Line", Bruce Campbell and Associates, 1969 (see Alternative 2 memorandum). Signal priority assumes that traffic intersections will include traffic control equipment allowing reduced wait times. The Peak Factor (.94) assumes a lower average speed during peak periods due to increased automobile traffic (Campbell and Associates study data).
- o Rapid transit alternatives assume station spacings similar to station distances for the Relocated Orange Line.
- o Commuter rail operating speeds are based on commuter rail station spacing/operating speed projections developed by Paul Frazier, MBTA, using diesel locomotive average operating characteristics for peak periods.

^d Peak Period Headways

- o Light rail and commuter rail alternatives were assigned peak period headways based on Study Team judgment of suitable "real time" levels of service given existing MBTA operating characteristics.
- o Rapid transit alternatives were assigned peak period headways similar to planned headways for the Relocated Orange Line.

^e Bus Feeder Operating Characteristics

Bus feeder networks were developed for each alternative based on bus routes presently serving the Study Area. A number of existing feeder bus alignments were modified due to the alignment and service characteristics of the alternative. Feeder bus headways and operating speeds primarily assumed the existing characteristics of study area bus services (except Bus Alternatives 6 and 10).

APPENDIX F: ANALYSIS OF BUSWAY OPERATIONS

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BUSWAY SOUTH OF GROVE HALL	F.12
Busway Design Considerations	F.12
Speed of Buses	F.13

INTRODUCTION

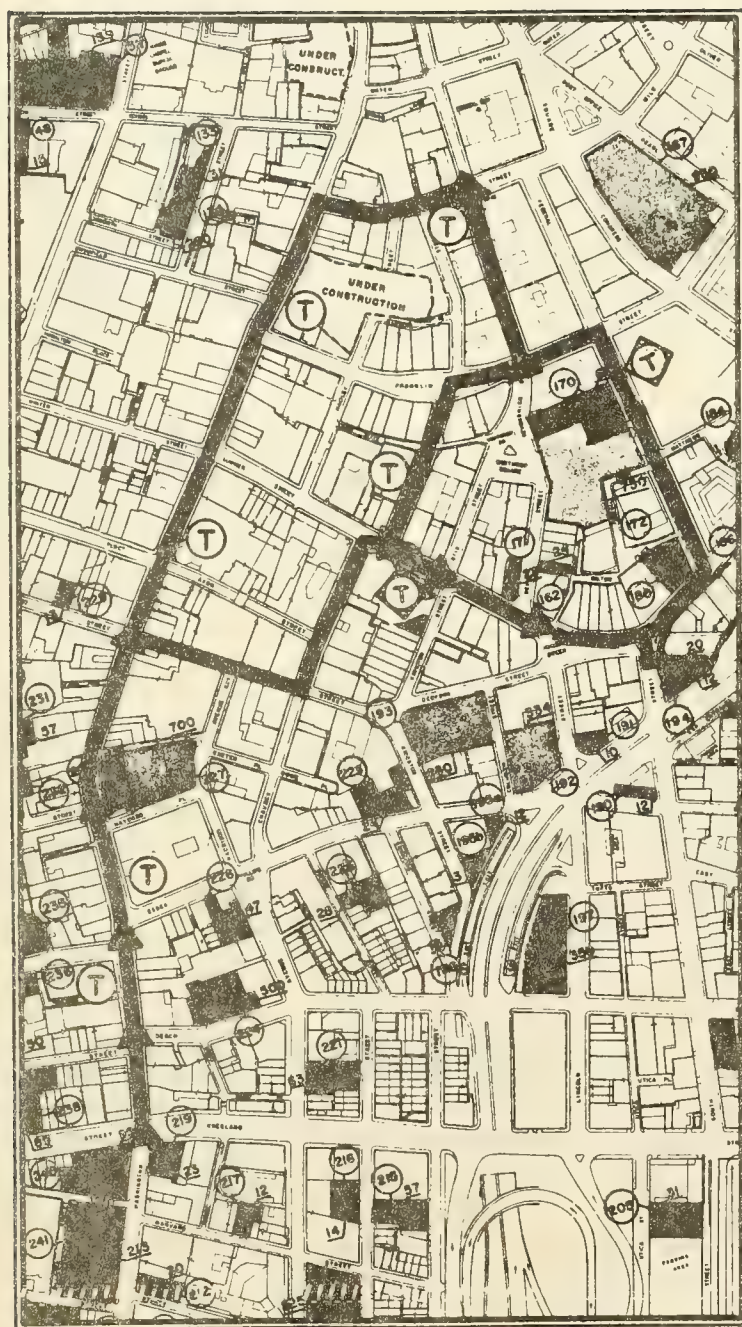
The purpose of this memorandum is to provide a preliminary analysis of busway operational considerations in the R/TIS area. Specifically for Phase I, the analysis is required to develop more precise data concerning busway speed and capacity characteristics to use in forecasting ridership levels for a busway alternative (Specific Alternative 6). In addition, the analysis identified several design and operational issues requiring detailed engineering during Phase II. Traffic analysis above and beyond the level of other alternatives in Phase I, was performed on Alternative 6 because operation data on urban busway systems are very limited. Boston contains no examples of a median busway and few other examples exist within the U.S.A. (see Table 4.4). It was important to get a preliminary idea of travel speed and capacity so that ridership estimates could be made in Phase I. Considerably more detailed traffic operations analysis for this and all other alternatives using surface streets will be required in Phase II.

BUS TRAVEL IN AUTO RESTRICTED ZONE (ARZ)

The proposed Boston Auto Restricted Zone will include a series of bus streets, from which most vehicular traffic would be excluded. Figure F.1 depicts the ARZ, which would serve, in part, as the terminus point and turn-around area for buses entering downtown Boston on the busway. The length of the bus street loop within the ARZ would be 6,330 feet, and it would contain six bus stops. A bus entering the ARZ and completing the entire loop would pass through thirteen traffic signals.

To determine the speed of a typical bus traveling through the ARZ during the peak hour, a number of conservative assumptions were made:

- a) Maximum bus speed in the ARZ would be 25 mph.
- b) Buses would travel slower than 25 mph around corners, and when near to traffic signals and bus stops.
- c) Buses would experience delays at some traffic signals. It was assumed that each bus would be delayed at nine of the thirteen signals for an average of 25 seconds at each delay stop.
- d) It was assumed that each bus would stop at each of the six designated bus stops. Three of the bus stops would require relatively short dwell times of approximately 15 seconds. Similar dwell times were observed in a 1972 study along Massachusetts Avenue between Albany Street and Boylston Street. At other bus stops, such as in front of Jordan Marsh and Woolworths, dwell times of one minute or more during the evening peak hour may be expected. The average dwell time per bus stop was assumed to be 40 seconds.



LEGEND




-  LOCAL BUS STOP
-  EXPRESS BUS STOP
-  TRAFFIC SIGNAL

FIGURE F.1
BUS LOOP IN AUTO RESTRICTED ZONE

- e) The number of buses entering the ARZ at Kneeland Street during the peak hour was estimated to be 87, based on Alternative 6 operating characteristics. The bus queue delay (queued buses prevented from moving freely) was estimated to be seven seconds per bus at each of the six bus stops.
- f) Pedestrian observance of traffic signals and pedestrian jaywalking habits in Boston would have a negative effect on bus travel in the ARZ. To quantify this type of delay, each bus was assumed to be delayed at each traffic signal an additional seven seconds.

The above conservative assumptions provided an average peak hour bus travel speed in the ARZ of slightly less than 5 mph. Although it was recognized that traffic engineering improvements and bus operation procedures could increase this speed substantially, 5 mph was used in order to be conservative in estimating bus riders for alternative 6.

For a peak hour bus flow of 87 buses and a dwell time of 60 seconds (bus stop at Jordan Marsh), a total of four berths are required, which translates into 180 feet of required curb space. All bus stops have adequate curb space for bus berths.

BUSWAY NORTH OF GROVE HALL

Location of Busway

The busway would run along Washington Street south to Warren Street, then southerly along Warren Street to King Boulevard. From King Boulevard the busway would continue southerly to Grove Hall, via either Warren Street or along a one-way street to Blue Hill Avenue and then southerly along Blue Hill Avenue to Grove Hall (see Figure E.6).

Preliminary Busway Design

Figure F.2 depicts a Washington/Warren Street busway design consisting of two moving bus lanes, two traffic lanes and one parking lane. Platforms and/or divisional islands provide separation between bus lanes in the median and traffic lanes. At signalized intersections separate traffic left-turn lanes are provided as well as bus pull-offs at far-side bus stops. The platform width at the bus stop is six feet and the divisional island is four feet wide.

Parking at the curb may be allowed, except at intersections. Median breaks are to be provided at all signalized intersections. Parking may be

permitted on both sides of each travel lane where adequate right-of-way exists, as shown in Figure F.2. The curb-to-curb width of the preliminary busway design is 94 feet, suggesting a minimum right-of-way of 110 feet. This is the right-of-way dimension of Washington Street between Berkeley and Eustis Streets.

Busway Operation

Traffic signals along the busway would operate in a fully-actuated mode consisting of three primary phases: Phase A - Washington Street (or Warren Street) green; Phase B - Washington Street left turn phase; Phase C - cross-street green. Buses and Washington Street traffic would move concurrently but no interference from left turns is anticipated, because Washington Street left turns would be restricted to Phase B. Pedestrians would cross Washington Street concurrently with cross-street traffic, i.e., during Phase C.

All traffic signals between King Boulevard and Kneeland Street would be interconnected and a background cycle would be provided by a busway master controller. The length of the background cycle is assumed to be determined by the intersection of Washington Street/Massachusetts Avenue, which is a part of the Mass. Avenue computerized traffic control system. The Mass. Avenue computer would have to be modified to include an additional address that reports the condition (i.e., cycle length, split and offset) of the Washington Street/Mass. Avenue intersection to a coordinating unit. This unit would relay the information to the busway master control which in turn, establishes the background cycle and offsets for busway intersections.

Cycle Length

During off-peak hours, the busway would operate on a 60 or 70-second cycle. Most of the traffic signals along Washington Street are presently operating at this cycle length. During peak hours, the busway cycle will be determined based on needs of the busway and the Mass. Avenue computerized traffic control system. Excessively long cycle lengths along the busway would not be as efficient as shorter cycle length because 1) cross street volumes are relatively low, and 2) bus preemption possibilities are somewhat more restricted.

Coordination of Cross-Street Traffic

Most of the traffic signals along the proposed busway are interconnected and coordinated with various other adjacent signals. The busway interconnection logic would only coordinate traffic movements along Washington or Warren

Streets, while all cross-street coordination (except Massachusetts Avenue) would cease. The reason for this is that the cycle length of existing signals is predetermined by time of day or day of week, while the busway cycle lengths would be based on traffic conditions along Massachusetts Avenue. The result of giving preferential treatment to the busway is that delays and the number of stops on cross-streets would increase.

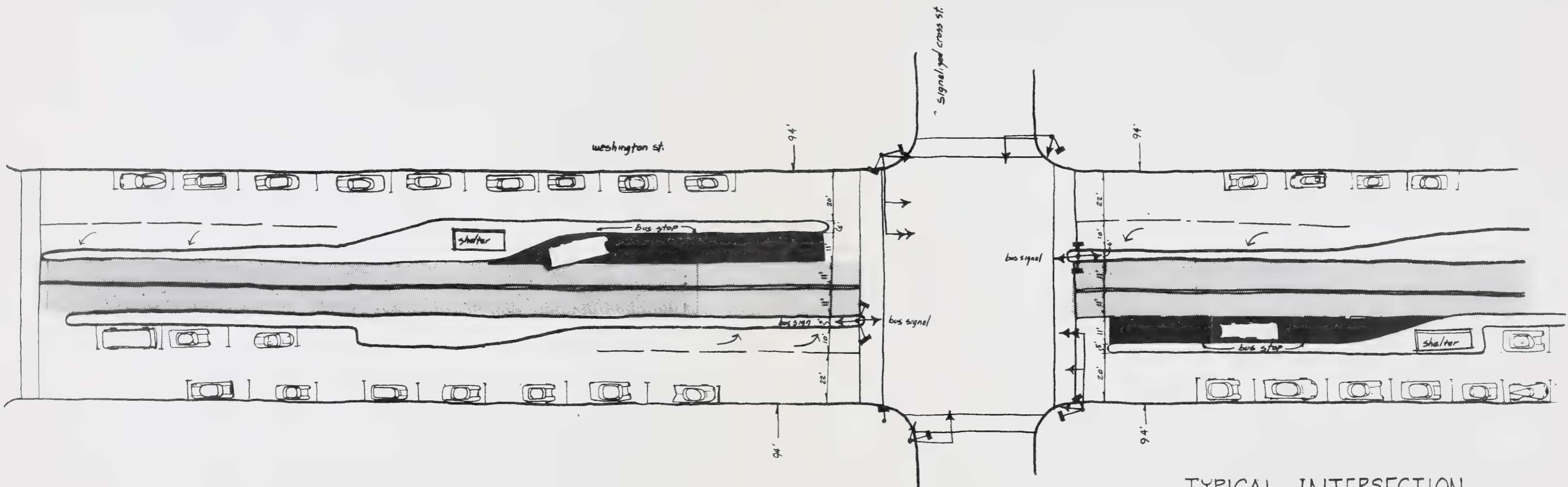
When looking at the movement of people rather than the movement of vehicles, the concept of giving a higher priority to busway coordination rather than cross-street movement coordination appears valid. The busway is expected to carry an average of 75 buses per hour in the peak direction, based on Alternative 6 operating characteristics. Assuming a ridership of 50 persons per bus, this translates to a movement of 3,750 people per hour on the busway. Cross-street traffic volumes between Kneeland Street and King Boulevard run less than 1,200 vehicles per hour (Massachusetts Avenue excluded). Using an average vehicle occupancy of 1.5 persons per vehicle, this translates into a movement of 1,800 persons per hour on the cross-street. In the case of Massachusetts Avenue, the street traffic is in excess of 2,000 vehicles per hour, or over 3,000 people per hour. Because the movement of people on the busway and Massachusetts Avenue would be approximately the same, traffic signalization along Massachusetts Avenue and the busway might get equal consideration. (However, a policy to encourage transit usage could provide for busway preference at this intersection.)

Interconnection Logic

All traffic signals along the busway north of King Boulevard would be interconnected to provide for progressive movement in the desired direction of bus travel. In the PM peak hour, the signal timing would favor outbound movement. In the AM peak hour, inbound bus movement would be favored, and during the off-peak periods, balanced progressive flow would be sought.

Bus Preemption

Bus detection would be accomplished by the installation of under-pavement detectors. Vehicle detectors would also be installed on all approaches of each signalized intersection as part of the fully-actuated mode of operation. All phases would be serviced during each cycle if there is demand, but the amount of time allocated to each phase would depend on busway needs. Under the worst condition, the level of service for a signalized intersection is expected to be D or above. Pedestrian push-button actuation would guarantee a safe pedestrian crossing of the busway. The absence of left-turns on Washington (or Warren) Street would result in skipping of Phase B, and the allocation of its green time to the other two phases.



TYPICAL INTERSECTION
FOR WASHINGTON ST.
BUSWAY



FIGURE F.2

As part of the bus preemption logic, advance bus detectors would be located 400-800 feet ahead of the traffic signal. Since most bus stops would be located on the far side of each intersection, bus arrival times may be predicted. If the predicted arrival is to be during normal artery green, the bus signal is, in effect, disregarded. If the arrival is anticipated just prior to normal busway green, the signal may be advanced to permit a bus to pass through the signalized intersection without stopping. If the bus arrival would occur shortly after the end of normal artery green, the busway green phase may be extended by a predetermined amount of seconds. Finally, a bus approaching an intersection during the middle of a minimum guaranteed side street green period would have to stop and wait at the intersection for the next green phase. In summary, bus preemption is not designed to give total, or absolute, bus priority, but preemption within specified or predetermined limits.

Capacity at Critical Intersection

A capacity analysis was performed on the intersection of Massachusetts Avenue/Washington Street to determine the busway's effect on traffic operations at that location. This is the busiest intersection in the busway section located north of King Boulevard, and if the busway concept could be made operable here, it could also be made to work at all other locations.

Using 1973 traffic volumes, the intersection operated at Level of Service B during the PM peak hour which is good for urban streets. Although traffic volumes on Massachusetts Avenue have increased by nearly 20% since 1973, traffic projections show that the new Crosstown Street will divert a considerable amount of traffic from Massachusetts Avenue. The end result may be that when this major new crosstown street is opened, the traffic volumes on Massachusetts Avenue would probably return to 1973 levels or lower.

The busway design was superimposed over the intersection and another capacity analysis was performed, using 1973 traffic figures. The intersection of Massachusetts Avenue/Washington Street, containing a median busway, was calculated to be operating at Level of Service C, which is also satisfactory.

Exclusive Pedestrian Phasing

If Washington Street were widened to 94 feet (curb-to-curb), as shown in Figure F. 2, it would take an average pedestrian 23 seconds to cross it. If an exclusive pedestrian phase were to be provided at some busway intersections, the amount of time necessary for this phase would be 30 seconds. It is anticipated that pedestrian signal actuation as a result of the busway would increase, and an exclusive pedestrian phase would probably be called every cycle. The busway concept, as shown in Figure F. 2, could not work if a fourth phase - an exclusive pedestrian phase - were to be added to intersection control strategy.

The busway concept requires pedestrians to cross concurrently with cross-street traffic, i.e., during Phase C. To assist pedestrians in getting to and from bus platforms, mid-block pedestrian signals could be provided near bus shelters as shown in Figure F.2.

Fare Collection Methods

The type of fare collection method used on the busway would have an affect on dwell times at bus stops and, consequently, on bus travel times. For the purpose of this analysis, the worst condition was assumed: for inbound movements, a pay when boarding collection method was assumed and for outbound flow, a pay when exiting method was selected. In the ARZ, the worst condition was also assumed, i.e., the pay when boarding collection method.

Bus Stop Dwell Times

Fare collection when boarding through a single door was taken to be 3 seconds dwell time per passenger. Disembarking dwell times for a pay when boarding method and boarding times for a pay when exiting method were taken to be 2 seconds dwell time per passenger. A clearance time of 5 seconds per bus stop was assumed for each time a bus stopped.

Speed of Buses

The speed of a bus in a busway depends on the number of stops, maximum bus operating speeds, the dwell time at each stop, and traffic and pedestrian conflicts at intersections.

Bus Operating Speed Between Stops

It was assumed that the maximum bus speed attained on the busway would be 35 MPH. The average running time between bus stops would follow the formula $t = 40 \text{ sec.} + \frac{D-1200}{51.3} \text{ sec.}$, where D = distance between stops.

Dwell Times at Bus Stops

The number of buses traveling the busway would be variable. There are an estimated 77 peak hour buses entering the Auto Restricted Zone on the busway, 87 buses would travel between Dudley Station and South Cove, 79 buses between Dudley Station and King Boulevard and 62 buses between King Boulevard and Grove Hall (Alternative 6 operating assumptions).

Daily inbound boardings along segments of the busway were derived by CTPS. Assuming that 20% of the inbound trips would occur during the

morning peak hour, and dividing this amount by the number of station stops, the average number of inbound passengers per stop was determined. Dividing inbound passengers per stop by the number of peak hour buses yielded passenger boardings per bus per stop.

The number of riders disembarking at each station along the busway during the morning (inbound) peak hour was also determined. Using dwell times of three seconds per boarding passenger and two seconds for each person getting off a bus, plus a five-second clearance for each bus stop, total inbound dwell times for each segment of busway were obtained. Between the ARZ and Dudley Station, the average dwell time is approximately 14 seconds per stop; between Dudley Station and Grove Hall, the average dwell time is approximately 24 seconds.

Intersection Conflicts

The busway would be protected from midblock vehicular interferences by divisional islands and platforms. At signalized intersections, left turns would be separated in time by an exclusive phase. At non-signalized intersections busway priority could be emphasized by regulatory signs, such as standard YIELD signs. Further restrictive steps could be taken, such as the signalization of all streets crossing the busway and/or prohibiting left turns from Washington Street or Warren Street across the busway at non-signalized intersections.

All traffic signals along the busway north of Dudley Station would be timed for approximately a 15 mph progressive speed. In the morning peak, the progression would favor inbound bus traffic, while in the evening peak, outbound progression would be maintained. An outbound bus entering the busway at Kneeland Street could maintain an average speed of 15 mph all the way to King Boulevard, assuming that each bus stops at each designated bus stop for an average dwell time of 14 seconds. South of Dudley Station, the average dwell times would be 24 seconds per stop, but the additional times would not reduce the overall trip speed to Grove Hall below 15 mph, since there are fewer bus stops south of Dudley Station.

Bus preemption would be available at all traffic signals, except at Massachusetts Avenue. Bus preemption and bus pull-offs would permit bus passing maneuvers. The average speed for a bus would increase by approximately 1.5 mph if a bus skips one of the 10 stops.

A bus skipping three stops would pass one bus on the average and could achieve an average speed of 20 mph between the ARZ and Grove Hall. An express bus with the capability of passing local buses could achieve a maximum overall speed of approximately 25 mph while traveling non-stop between the ARZ and Grove Hall.

Arterial traffic signal systems designed to move vehicles are not set for a low progressive speed of 15 mph, but are generally set for speeds of 20 to 35 mph. The lower speed of 15 mph would have an effect of discouraging vehicular through travel on Washington and Warren Streets. Because present Washington Street and Warren Street traffic volumes are 15,000 vehicles per day or less, the restrictions imposed by low 15 mph progressive speed may probably be acceptable, if overall benefits to vehicles and buses are considered.

Inbound bus speeds in the afternoon peak and outbound bus speeds in the morning peak hour would generally be below 15 mph -- approximately 13 mph. Even express bus speeds in the "off-peak" direction would be no higher than 22 mph, and sometimes as low as 15 mph.

The section of the busway between King Boulevard and Grove Hall may take one of two alignments: The first route would continue the busway on Warren Street. However, right-of-way constraints along Warren Street would require either no on-street parking or eliminating the busway in this section. The second route would take the busway along two parallel one-way streets to Blue Hill Avenue and then southerly along a median reservation in Blue Hill Avenue (where property takings would be required). Because of the uncertainty of the alignment, analysis of signal priority for this segment is deferred to Phase II. However, it is assumed that the overall speed north of Grove Hall would remain at 15 mph in the predominant direction.

BUSWAY SOUTH OF GROVE HALL

The busway in this section would be located in a median along Blue Hill Avenue, between Grove Hall and Mattapan.

Busway Design Considerations

Blue Hill Avenue Traffic Volume

The average daily traffic on Blue Hill Avenue is 28,000. This is twice the amount of traffic on Washington Street or Warren Street.

Preliminary Busway Design

Because of the higher traffic volumes that have to be maintained on Blue Hill Avenue, the busway should allow for two moving traffic lanes, plus a parking lane in each direction. This means that the design in

Figure F.2 would have to be modified to include one additional traffic lane in each direction. The curb-to-curb width of the Blue Hill Avenue busway would have to be 118 feet, suggesting a minimum right-of-way of 135 feet. The existing right-of-way is 120 feet from Grove Hall to Talbot Avenue and 132 feet south of Talbot Avenue to Mattapan.

Number of Buses and Ridership

The number of buses traversing this portion of the busway would be considerably less than north of Grove Hall (Alternative 6 operating assumption), and the number of people riding the buses would also be considerably below the projected average of 50 passengers/bus in the northern segment. South of Morton Street the number of people on the busway would be well under 1,000 per peak hour. Between Morton Street and Grove Hall ridership would be less than 1,500 per peak hour in the inbound direction. In contrast, the two-way movement of people (total traffic) per peak hour using Blue Hill Avenue is presently in excess of 3,300.

Bus Stops and Speed

The spacing between bus stops on this section of the busway is somewhat greater than station spacing in the northern segment. Buses, therefore, may achieve a higher average speed between stops. If the maximum bus speed is increased to 40 mph for station spacings in excess of 2000 feet, additional time savings can be accrued.

Bus Dwell Times

Bus dwell times south of Grove Hall would generally exceed 30 seconds per stop, based on Alternative 6 operating characteristics. The greater the average bus dwell time, the greater is the deviation in dwell times at bus stops. In other words, if the average dwell time is 30 seconds per bus, consecutive buses may experience dwell times between 15 and 45 seconds. When dwell times vary over a wide range, bus arrival times at downstream traffic signals cannot be as readily predicted.

Bus Preemption at Traffic Signals

Bus preemption at intersections south of Grove Hall would be provided wherever possible. The Blue Hill-Morton Street intersection handles very high traffic volumes and it may be difficult to provide preemption at this point.

Speed of Buses

It is expected that the Blue Hill Avenue busway segment would contain all elements of the busway design depicted in Figure F.2, plus one additional traffic lane in each direction. Traffic signals would be interconnected, and set for progressive speeds of 30-35 mph. Bus preemption would be provided at most traffic signals and far-side bus stops would be maintained. Bus speeds along the busway, south of Grove Hall, would be approximately 15 mph.

APPENDIX G: BIBLIOGRAPHY

1. Applied Resource Integration, Ltd. Estimates of the Transportation Handicapped & Elderly in the MBTA Region for 1977 .. Massachusetts Bay Transportation Authority, July 1976.
2. Boston Redevelopment Authority (BRA). District Profiles and Proposed 1977-1979 Neighborhood Improvement , Fall 1976.
3. Boston Transportation Planning Review (BTPR). Southwest Report . Executive Office of Transportation and Construction, Massachusetts Department of Public Works, Massachusetts Bay Transportation Authority, September 1972.
4. Boston Transportation Planning Review (BTPR). Southwest - Special Mobility Study . Executive Office of Transportation and Construction, Massachusetts Department of Public Works, Massachusetts Bay Transportation Authority, April 1973.
5. Campbell, Bruce and Associates. Surface Car Line Operations Study - Beacon Street - Green Line - Brookline and Boston . Massachusetts Bay Transportation Authority, May 1969.
6. Central Transportation Planning Staff (CTPS). Transportation Systems Management Element of the Transportation Plan & Program for the Boston Region . Metropolitan Planning Organization, March 1977.
7. DeLeuw, Cather & Company. Central Area Systems Study - Volume II , June 1971.
8. DeLeuw, Cather & Company. Characteristics of Urban Transportation Systems - A Handbook for Transportation Planners . Urban Mass Transportation Administration, U. S. Department of Transportation, May 1975.
9. DeLeuw, Cather & Company. Light Rail Transit: State of the Art Review . Office of Policy and Program Development, Urban Mass Transportation Administration, U. S. Department of Transportation, Spring 1976.
10. Dyer, Thomas K., Incorporated. Plan for Acquisition and Use of Railroad Rights-of-Way . Massachusetts Bay Transportation Authority, December 1972.

11. Dyer, Thomas K., Incorporated. Preliminary Design Report for the Reconstruction of Dorchester Branch . Massachusetts Bay Transportation Authority, February 1977.
12. Dyer, Thomas K., Incorporated. Rail Transit System Cost Study . Office of Research and Development, Urban Mass Transportation Administration, U. S. Department of Transportation, January 1976.
13. Executive Office of Transportation & Construction (EOTC). Staff Reports 1-7 . Joint Regional Transportation Committee and Transit Development Committee of the Advisory Board to the Massachusetts Bay Transportation Authority, Spring 1976.
14. Executive Office of Transportation & Construction (EOTC). Technical Supplement to the PMT - Volume III - Chapter 5 - The Southwest Corridor . Transit Development Committee of the Advisory Board to the Massachusetts Bay Transportation Authority, April 1977.
15. Executive Office of Transportation & Construction (EOTC). 1977 Revised Program for Mass Transportation (PMT) . Transit Development Committee of the Advisory Board to the Massachusetts Bay Transportation Authority, April 1977.
16. Highway Research Board. Bus Use of Highways - State of the Art , Report No. 143. National Research Council, 1973.
17. INTERPLAN Corporation. Transportation System Management - State of the Art . Office of Policy and Program Development, Urban Mass Transportation Administration, U. S. Department of Transportation, September 1976.
18. Maguire, C. E., Incorporated and Childs, Bertman, Tseckares, Associates, Incorporated. Tremont Street and Columbus Avenue Reconstruction - A Preliminary Design Report . Boston Redevelopment Authority, July 1975.
19. Massachusetts Bay Transportation Authority. Central Area Systems Study - Volume I , June 1971.
20. Massachusetts Bay Transportation Authority. Final Application for a Mass Transportation Capital Improvement Grant for a Midland Reconstruction and Acquisition Project . Urban Mass Transportation Administration, September 1975.
21. Massachusetts Bay Transportation Authority, Massachusetts Department of Public Works and Frederic R. Harris, Inc. Southwest Corridor - Environmental Impact Analysis , May 1976.
22. NATO Committee on the Challenges of Modern Society. Bus Priority Systems . CCMS Report No. 45. United Kingdom: Transport and Road Research Laboratory, Department of the Environment.

23. Office of the Mayor - City of Boston. The Boston Plan . August 1977.
24. Parsons, Brinckerhoff, Quade & Douglas, Incorporated. Central Area Systems Study - Tremont Street Subway Extension - Engineering Design Study . Massachusetts Bay Transportation Authority, June 1968.
25. Southwest Corridor Land Development Coalition, Incorporated. Institutional and Commercial Development in Boston's Southwest Corridor . Massachusetts Department of Community Affairs, July 1977.
26. Transportation Research Board. Bus Use of Highways - Planning and Design Guideways . Report No. 155. National Research Council, 1975.
27. University of Pennsylvania, Wharton School, Regional Science Department. Impact of Rapid Transit on Suburban Residential Property Values and Land Development . Office of the Secretary, U. S. Department of Transportation, November 1972.
28. Urban Mass Transportation Administration and Federal Highway Administration. Draft Environmental Impact Statement - Orange Line Relocation and Arterial Street Construction , February 1977.
29. Vollmer Associates. Minuteman Area Transit Study (MATS) - Phase I Report . Massachusetts Bay Transportation Authority, February 1977.
30. Yoneoka, Brad. Commercial Development at a New Dudley MBTA Transit Station in Roxbury - A Pre-Feasibility Analysis , September 1977.

APPENDIX H: GLOSSARY

ALIGNMENT

The horizontal location of the transit system.

ARTERIAL STREET

A major street characterized by a high vehicular carrying capacity and continuity to other streets.

ARTICULATED BUS

A type of bus whose standard length is increased by addition of either another bus or section of a bus and joined to allow operation as one unit.

ARZ

Auto Restricted Zone. An ARZ is planned for the Downtown Boston shopping district and will include a series of bus streets from which most other vehicular traffic would be excluded.

AT-GRADE

The vertical location of the transit system at or near the existing land surface.

B&M

Boston and Maine Railroad. Operates commuter rail service under contract to the MBTA.

BRA

Boston Redevelopment Authority. The official planning agency for the City of Boston.

BTPR

Boston Transportation Planning Review. Created in 1970 by Governor Sargent, the BTPR conducted a comprehensive review of Boston's transportation needs. Recommended dropping plans for the Southwest Expressway in 1972.

BUDDLINER

Self-contained diesel-powered coaches used by the MBTA on many of its commuter rail lines. Also called RDC.

BUS LANE

A street or highway lane intended primarily for buses, either all day or during peak hours, but which other traffic may use under certain circumstances; for instance, in making a right turn. If traffic is physically discouraged or prevented from using the bus lane--for example, by having the bus lane in the median strip of freeway -- the bus lane should be referred to as an EXCLUSIVE LANE.

BUSWAY

All or part of a roadway dedicated exclusively to bus operations.

CAPACITY

A measure of the ability of the system, route or street to accomodate traffic. Two levels of ability are generally recognized and are referred to as "practical" and "possible" capacity. Operating conditions under possible capacity conditions are worse than those under practical capacity conditions.

CAPITAL COST

The cost associated with initiating a complete system including right-of-way acquisitions, construction, rolling stock, engineering and architectural services, administration and legal services.

CBD

Central Business District. That center or core of a region where the most intensive business activity is concentrated.

CBT

Childs, Bertman, Tseckares, Casendino, Inc. Community liaison consultants to the R/TIS.

CIRCUMFERENTIAL TRANSIT

Transit line which is nonradial in nature, i.e., not directed to or from the Boston Central Business District. Connects either community subcenters or radial linehaul services. Specific proposals to examine a circumferential transit system in Boston and Cambridge have been made.

COMMUTER RAIL

Passenger rail service which generally brings users from outlying suburbs into the central city at South Station, Back Bay Station, or North Station and is characterized by low platforms, on-board collection, etc.

CONTRA-FLOW BUS LANES

Bus lanes in which the buses operate opposite to normal traffic flow and are separated from other traffic.

COORDINATING COMMITTEE

This committee is made up of agency representatives, consultants, and members of the community who meet on a weekly basis to discuss progress of the R/TIS.

COST EFFECTIVENESS

The level of performance achieved by a system for a given expenditure or, alternately, the cost for a system to achieve a desired level of performance.

CROSTOWN STREET

This proposed street -- from the Massachusetts Avenue exit of the Southeast Expressway, near City Hospital, to Ruggles Street and Columbus Avenue -- will occupy some of the land initially cleared for the Inner Belt. It is currently being designed.

CRUSH LOAD

The point at which maximum "possible" capacity is reached. Used to describe passenger loads inside transit vehicles.

CTPS

Central Transportation Planning Staff. The inter-agency staff responsible for a large part of the technical and community liaison transportation planning work in the Boston region.

CUT-AND-COVER

A construction technique whereby a tunnel or underground station is constructed by excavating the terrain from ground level to build the facility box and then filling in the excavation to complete the construction.

DC

Direct current. The kind of electric power used by a subway car, streetcar, or trackless trolley.

DIAMOND LANE

Specially marked exclusive lanes which give preferential treatment to transit vehicles. These lanes either are used exclusively by buses or are shared with taxis and right-turning vehicles when appearing in local traffic. (On expressways, these lanes may be shared with car-pool users.) They can operate either with or counter to automobile traffic.

DPW

Department of Public Works, usually referring to the Massachusetts Department of Public Works. (See MDPW.)

DUAL-MODE TRANSPORTATION

System wherein vehicles may be operated in both of two modes: (a) manually controlled and self-propelled on ordinary streets and roadways, and (b) automatically controlled or externally propelled (or both) or powered on special guideways.

DWELL TIME

The time measured from the instant a vehicle stops at a station until the instant it resumes moving.

EIS

Environmental Impact Statement. A detailed document or "statement" on the environmental impacts, both positive and negative, associated with a proposed transit project.

EL

Elevated transit line, usually referring herein to the existing Orange Line elevated transit structure on Washington Street.

EMRPP

Eastern Massachusetts Regional Planning Project. A study that assessed transportation needs for the Boston region in the 1960's.

EOTC

Executive Office of Transportation and Construction. The state cabinet-level agency responsible for transportation.

EXPRESS SERVICE

A type of operation by bus or rail providing higher speeds with fewer stops than generally exist on other portions of the system or on the same route.

FEEDER SERVICE

Transit service which provides access to and from a service providing line-haul service.

FHWA

Federal Highway Administration, part of the U.S. Department of Transportation.

FY

Fiscal year. The federal fiscal year runs from October 1 to September 30, the state fiscal year from July 1 to June 30, and the MBTA fiscal year coincides with the calendar year. Fiscal year number refers to calendar year in which fiscal year ends. For example, federal fiscal 1977, or FY 77, ends on September 30, 1977.

GRADE SEPARATION

A crossing of two transportation services at different vertical locations resulting in unhindered vehicle flow.

GRAVITY MODEL

A mathematical model used to develop estimates of trip origins and destinations. Also see TRIP DISTRIBUTION.

GUIDEWAY (FIXED)

An exclusive right-of-way for transit vehicles separated from other traffic.

HEADWAY

The time interval between two transit vehicles on the same route, usually measured in minutes.

HUD

U.S. Department of Housing and Urban Development.

HZ

Hertz, or cycles per second. Used to measure the frequency (pitch) of sound, or the phasing of alternating electric current.

INNER BELT

A formerly proposed, but now cancelled eight-lane highway, which would have circled the City's core through Roxbury, the Fenway, Brookline, Cambridge, Somerville and Charlestown.

I-95

Interstate Highway 95 running from Maine to Florida. One section of this route was planned to go through Boston until plans were scrapped in 1972. The Orange Line relocation in the Southwest Corridor will use the right-of-way taken for this route. See SOUTHWEST EXPRESSWAY.

JRTC

Joint Regional Transportation Committee. An advisory committee to the major transportation agencies in the Boston region.

LAYOVER TIME

See RECOVERY TIME.

LIGHT RAIL TRANSIT

A generic name for a transit mode consisting of electrically powered steel-wheeled rail vehicles operating predominantly on exclusive rights-of-way. Light rail transit is an intermediate-capacity, intermediate-speed mode providing service capabilities between full rapid transit and local bus operations. With the exception of Arborway Line local street service, the MBTA Green Line is a light rail transit system.

LINE HAUL SERVICE

Transit service which provides direct, primarily point-to-point travel between a residential area and an activity center such as a business district.

LRV

Light Rail Vehicle. The transit vehicle designed to meet light rail transit requirements (see LIGHT RAIL TRANSIT). The new Green Line vehicles are Boeing-Vertol LRV's.

MAPC

Metropolitan Area Planning Council. The agency responsible for comprehensive planning in the Boston region.

MBTA

Massachusetts Bay Transportation Authority. The authority responsible for public transportation in the 79 cities and towns in Eastern Massachusetts.

MDPW

Massachusetts Department of Public Works. The agency responsible for the construction and maintenance of state highways.

MODAL SPLIT

The third sequential step (following trip generation and distribution) in forecasting transit ridership. Modal split often refers to the division of trips (between every possible pair of zones) into those made by transit and those made by automobile.

MONORAIL

Single rail transit vehicle, which has had very limited application in this country. Usually has appeared as an elevated system, notably at Disneyland and Seattle, Washington.

MPO

Metropolitan Planning Organization. A committee of six agencies which is the final approving authority for transportation planning and programming documents required by FHWA and UMTA.

OPERATING COST

Those recurring costs in transportation systems which include driver's wages, salaries of administrative officers, maintenance, fuel, supplies, insurance, and fringe benefits.

OPERATING SPEED

Average speed attained by a vehicle when travelling in service between the terminal of a route and including passenger stops.

PA

Public address. A system for communicating with passengers in stations and on trains through loudspeakers.

PCC

Presidents' Conference Committee Car. The standard U.S. trolley car design developed in the 1930's, which has dominated U.S. streetcar and light rail operations. PCC's are used on the MBTA's Green Line and Ashmont-Mattapan Line.

PEAK HOUR

The peak hour is the 60-minute period during an average weekday when the greatest number of people travel past a specific point in one direction on a specific route.

PEAK LOAD POINT

The location(s) of maximum ridership on a transit route; used to help determine service frequency.

PMT

Program for Mass Transportation. Document specifying the MBTA transit program over a ten year period. Refers to the 1977 revised program.

PROFILE

The vertical location of the transit system.

PROJECT WORKING COMMITTEE (PWC)

The PWC consists of all interested people who meet on a monthly basis to provide overall direction of the R/TIS.

RAPID TRANSIT

Mass transportation either by rail or bus which is distinguished from other transit by its operation at high average speeds over exclusive, grade-separated right-of-way. Sometimes called "heavy rail" to distinguish it from light rail.

RDC

Rail Diesel Coach. See BUDDLINER.

RECOVERY TIME

Time built into a schedule as a contingency against delays a vehicle may encounter along the route and to provide a break for the vehicle operator.

RELOCATED ORANGE LINE

Project to construct a new Orange Line rapid transit facility in a depressed right-of-way along the Penn Central Mainline. Design is under way at the present time. Will replace Washington Street elevated tracks between Essex Station and Forest Hills.

REVENUE

Revenue is the gross income from operation of the transit system, including basic and special fares, and income from charters, concessions, advertising, etc. Does not include interest from securities, nonrecurring income from sale of capital assets, etc.

RIDERSHIP

The level of transit utilization, measured in person-trips.

RIGHT-OF-WAY (R. O.W.)

The land used or required for transit operations.

R/TIS

The Replacement/Transit Improvement Study is an analysis of current and future public transportation needs in the South End, Roxbury, Dorchester and Mattapan areas of Boston.

SCHEDULE SPEED

The expected speed of a vehicle from terminal to terminal, including time for intermediate station stops and recovery time.

SOUTHWEST EXPRESSWAY

Name given to the portion of I-95 which was to have entered Boston from the south and continue through Hyde Park, Roslindale, Jamaica Plain, and Roxbury. The project was dropped in 1972. The relocated Orange Line will use portions of this right-of-way.

SUBWAY

An underground rail transit system.

TAMS

Tippetts-Abbott-McCarthy-Stratton. Overall consultants for the Replacement/Transit Improvement Study.

TIP

Transportation Improvement Program. A federally-mandated document which includes the short-range highway and transit programs.

TRACKLESS TROLLEYS

Trackless trolleys are essentially buses using an overhead electrical power source. The MBTA operates three trackless trolley lines, all through Harvard Square. They are sometimes called trolley buses or trolley coaches.

TRIP ASSIGNMENT

The fourth and final step (following trip generation, trip distribution, and modal split) in forecasting transit ridership. Trip assignment estimates the specific transportation service that persons assigned to transit will use among available services such as bus only, bus to fixed rail, or fixed rail only.

TRIP DISTRIBUTION

The second sequential step (following trip generation) in forecasting transit ridership. Trip distribution utilizes the output of trip generation to develop the projected number of trips between every possible pair of zones. Trip movements are estimated separately for different trip purposes.

TRIP GENERATION

The first sequential step in forecasting transit ridership. Trip generation estimates the number of trips (by purpose) which originate and terminate in each zone.

TRIP ORIGIN AND DESTINATION

See TRIP DISTRIBUTION.

TRIP TABLE

The matrix resulting from the end product of the trip distribution step i.e., the number of trips between every possible pair of zones by trip purpose.

TROLLEY

The popular term used to describe the Green Line vehicles.

TSM

Transportation Systems Management. An element of the region's transportation plan which describes plans to improve the effectiveness and efficiency of the highway and transit systems at minimum capital cost.

UMTA

Urban Mass Transportation Administration. The Federal agency, part of the U.S. Department of Transportation, responsible for administration of federal transit grant programs.

VMT

Vehicle Miles of Travel. An aggregate total of miles travelled in an area during a given time period (usually a day).

ZONE

An area in which data required for the ridership forecasting analysis is aggregated. The R/TIS area is divided into approximately 75 of these zones.

ZONES OF SERVICE

The R/TIS area was divided into four sections, or zones, in order to determine how new transit service would affect the transit needs of various neighborhoods.

"3C"

Comprehensive, Continuing, Cooperative. Describes the transportation planning process required by federal law.

Meeting Handout

QUESTIONS & ANSWERS

- Q. WHY IS THIS STUDY CALLED REPLACEMENT/TRANSIT IMPROVEMENT?
HOW WAS THE STUDY STRUCTURED TO MEET BOTH THE "REPLACEMENT"
AND "IMPROVEMENT" NEEDS?

Historically, the "replacement" aspect of the Replacement Transit Improvement Study was the result of our commitment to evaluate the effects of relocating the existing elevated Orange Line on Washington Street and provide a substitute service where needed. "Transit improvement" was meant to apply to other sections of the study area not presently served by the elevated. This does not imply that whatever recommendations are made for replacement service would not also constitute a transit improvement. In this context, some sections of the study area can be clearly identified as requiring either "replacement service" or to be in need of "transit improvements," while recommendations for other sections can best be made using a combination of the two concepts.

On this basis, four zones of service were defined. Zone 1 - South End to Dudley Square - encompasses an area equidistant from Washington Street, is the one most affected by the relocation of the Orange Line and is therefore the zone in which replacement service must be evaluated. Zone 2 - Dudley Square to Grove Hall - identifies a section of the study area requiring evaluation of both concepts since it is affected on the west by the relocation of the Orange Line and is presently served on the east and south by a network of feeder buses. Zone 3 - Grove Hall to Mattapan Square - is presently served by a network of feeder buses to the Orange and Red Lines and would benefit from an evaluation of improved means of public transportation. Similarly, the travel needs of residents in Zone 4 - Columbia Point to Northeastern University which is part of a primary corridor for crosstown service - would be better met if the study could identify improved means of access between the neighborhoods at either end of the zone.

This diverse set of needs and requirements gives rise to a rather large number of possible combinations. In order to facilitate the identification of a manageable number of viable transit alternatives for the entire study area, an evaluation of four transit modes (busway, light rail, commuter rail and rapid transit) was made first. This evaluation was based on an analysis of eleven specific alternatives. These specific alternatives included the most likely combinations of major alignments. A determination of which modes should be analyzed further in Phase II was then made. Then, the specific alternatives for each surviving mode were compared in each of the four zones of service, to see which alignments should be analyzed in Phase II. The end result was a series of modes and alignments in each zone of service recommended for Phase II study.

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Phase I analysis has identified a number of modes and alignments which are accepted by the community and can meet the transportation needs of residents in each zone of the study area. Phase II analysis will concentrate on issues such as: detailed engineering analysis of pedestrian movement and safety; community preference; determination of the cost and feasibility of right-of-way acquisition; and impact on traffic on city streets and current transit operations. Analysis of these factors will indicate preferred alignments and modes in each zone of service. These alignments and modes will be combined into a small set of viable "alternatives" for the whole study area (consisting of modes and alignments in each zone, compatible with modes and alignments in all other zones) and detailed analyses of ridership, safety, community preference, environmental impact, construction costs, staging, etc., will be made. A single preferred alternative system will then be selected.

Q. A SERIES OF ALTERNATIVES FOR FURTHER PHASE II ANALYSIS WERE PRESENTED AND DISCUSSED AT THE OCTOBER PROJECT WORKING COMMITTEE MEETING. NOT ALL OF THESE HAVE BEEN RECOMMENDED FOR FURTHER STUDY. HOW WERE THE RECOMMENDATIONS SHOWN IN PHASE I REPORT MADE?

At the October Project Working Committee meeting the consultants, based on the analysis conducted during Phase I, recommended that various alignments and modes be either dropped or carried into Phase II of the study for detailed analysis. During the meeting, some participants expressed a desire to retain several of the options which had not been recommended or to eliminate some of those which had been recommended. In addition other options which had not been examined during Phase I were suggested for analysis in Phase II.

The MBTA Project Office, based on the consultants recommendations and the comments made at the October meeting arrived at the final recommendations shown in chapter 10 of the Feasibility Report and in the Summary Report. The specific reasons for not recommending rapid transit on any alignment and light rail on Washington/Seaver and Columbia Road alignments are given elsewhere in this handout.

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Q. WHY WILL RAPID TRANSIT OPTIONS NOT BE CONSIDERED IN PHASE II?

Analysis of transit alternatives during the study have shown that persons in the study area can realize greater benefits from a more extensive network of light rail, busway and/or commuter rail lines than from a single rapid transit line; and at far less over all cost.

Although rapid transit costs far more than other modes in the study area, such cost might be justified if significantly greater benefits to study area residents could be achieved. Traditionally, benefits of rapid transit have included the following:

- (1) greater passenger-carrying capacity
- (2) faster travel speeds
- (3) less disruption to vehicular traffic (after construction)
- (4) best potential for spurring development
- (5) most reliable

Each factor was examined during the study. Conclusions are as follows:

(1) Passenger-Carrying Capacity - Although rapid transit does provide greater passenger carrying capacity than light rail or busway, rider forecasts have shown that any foreseeable passenger demand can be served by either of the latter modes. Projected maximum peak hour demand under any mode option of 4,000-4,500 passengers can be accommodated in 2-3 car light rail vehicles or in buses in the busway. The busway has lesser capacity to handle large increases in demand, but could be converted to light rail line if and when greater capacity is required.

(2) Travel Speed - Rapid transit can provide faster service to downtown Boston from stations along the route than do other modes. However, travel time between all station and downtown for light rail and busway systems can be made reasonably comparable to rapid transit if maximum use of exclusive right-of-way is made, stations are spaced at least 1/4 mile apart and traffic preemptive signals are used. A single rapid transit line provides walk-in service only near stations which are spaced further apart than light rail or busway while other potential riders would take feeder bus service to get to a station, and most would find it equally convenient to take a bus to either the Orange or Red Lines. Actual door-to-door travel times for all users would benefit more from greater coverage of the study area by either busway or light rail lines.

(3) Less Disruption to Vehicle Traffic - Surface light rail or busway systems not on a separated R.O.W. like the Midland Railroad, take up part of the street right-of-way and therefore, reduce traffic carrying capacity. Rapid transit, which must be completely grade separated, only disrupts traffic during the construction period (although such a period is lengthy) because it tunnels under city streets. The long term disruption of surface systems (such as busway or light rail on a median reservation) can be mitigated

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through proper design and use of grade-separation when required and may actually be beneficial in some areas where policy is to discourage through traffic. Potential pedestrian movement and safety problems associated with surface systems must, however, be resolved either through proper design of the median or by tunnel sections where needed.

(4) Potential for Development - While rapid transit may provide somewhat greater stimulus to development than other modes, primarily around stations, this factor does not have to be significant if proper land planning accompanies development of other transit modes. Development in Brookline at Coolidge Corner and along Beacon Street are examples of the possible beneficial impacts of light rail. In addition, the tunneling requirements for rapid transit may potentially harm preservation efforts in areas like South End and would definitely be much more disruptive during the longer construction period.

(5) Reliability - Rapid transit in a subway would provide potentially more reliable service than surface modes, but only for those persons able to walk-in (a smaller number than on busway or light rail alternatives). Others would still have to transfer from local buses.

Weighed against these marginal benefits, rapid transit has some real disadvantages. It splits service on the relocated Orange Line which will reduce train frequency to the Southwest Corridor communities of Roxbury and Jamaica Plain. While the engineering requirements for a branch at either South Cove or Ruggles have not been explored in detail, it appears that large and very complicated structures would have to be provided in these areas to effect a branch. Construction of a subway on Washington Street or in the South End would have to await dismantling of the elevated and entail a service gap of at least 4 to 5 years.

A single line rapid transit system would benefit an area without any downtown-oriented rail transit systems in place. However, the study area already has both Orange and Red Lines on its periphery. In this case, a system which can collect and distribute riders over a greater area with more closely spaced stations would provide better coverage and greater user benefits. The table on the next page shows this by comparing a light rail alternative having both radial and crosstown service (Alternative 4) to rapid transit alternatives (Alternatives 5 and 8). A similar comparison could be made for busway alternatives.

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COMPARISON OF MODES

<u>Factor</u>	(LRV) <u>Alt. 4</u>	(R.T.) <u>Alt. 5</u>	(R.T.) <u>Alt. 8</u>
Daily New Riders	7,550	3,740	4,490
Daily Riders	36,300	29,800	28,100
Daily Travel Time Savings (Hours)	6,790	4,970	4,970
Daily Reduction in Auto Travel (Miles)	85,300	44,500	55,700
Capital Cost (Millions 1977\$)	161-202	315	637
Annual Cost (Millions 1977\$)	17.9-20.5	29.8	50.1
Cost Per Annual Rider (1977\$)	0.80-0.90	1.70	3.00

The dual network of light rail lines (Alt. 4) provides from 20% to 100% in greater benefits over rapid transit alternatives in terms of increased ridership (due in part to better coverage), savings in travel time and reduction of automobile travel. Yet, its capital cost and total annual cost is far lower. This clearly indicates that the cost to construct and operate a single rapid transit line in the study area could be spent more effectively in creating a network of light rail and/or busway lines.

For all these reasons, it does not appear productive to continue analysis of rapid transit into Phase II. The time and effort spent analyzing this mode could be spent more productively in working out details and evaluating alignments for other modes.

Q. DOES DROPPING RAPID TRANSIT MEAN THAT ALL OPTIONS STUDIED IN PHASE II WILL BE ABOVE GROUND?

Phase II of the study will look at light rail options both above and below ground. Underground sections for light rail lines will be considered where surface-running systems are not appropriate. Tunnel sections will be considered in areas where right-of-way is limited and property taking is not desirable (such as in the South Cove area, on Warren Street and on Dudley Street) and surface systems may cause major conflicts with pedestrian safety and/or vehicle movements (such as specific locations on Blue Hill Avenue south of Grove Hall).

Because of ventilation problems, all busway alternatives must run above-ground. However, tunnel sections for a trackless trolley are possible.

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Q. WHY WERE LIGHT RAIL SYSTEMS ON WASHINGTON-SEAVER AND COLUMBIA ROAD ALIGNMENTS ELIMINATED AS POSSIBLE OPTIONS IN PHASE II?

In Zone 2 of the study area (Dudley Station to Grove Hall), light rail alternatives were recommended for further study along Warren Street, Blue Hill Avenue and Midland Railroad segments, but not on the Washington-Seaver and Columbia Road segments. The Washington-Seaver alignment compared unfavorably to either Warren Street, Blue Hill Avenue or Midland Railroad alignments because it required extensive tunnelling or building demolition yet had a slightly lower ridership and savings in overall travel time than the other alignments. The lower ridership and travel time savings result from its proximity to the relocated Orange Line, particularly in the Egleston Square area. Warren, Blue Hill and Midland Branch alignments provide a more central location between Orange and Red Lines in the Roxbury, Uphams Corner area than the Washington-Seaver alignment.

The principal advantage of the Washington-Seaver alignment is that it directly serves Egleston Square which now has an Orange Line station. However, this area will also be served by the relocated Orange Line at Jackson Square Station which is only 1/2 mile away and will have feeder bus service. Currently, 65 percent of passengers using the Orange Line at Egleston Station arrive by either bus or automobile. In addition, the allocated Orange Line's new Boylston Street Station is only 1/3 mile away from Egleston Square.

The primary reason for eliminating Columbia Road as an alignment for light rail or busway is that it serves only a limited transportation purpose. It connects Uphams Corner and Grove Hall but, unlike the Midland Railroad, does not serve as a potential link between the study area and downtown. The ridership model indicated that it would attract only 1,800 daily riders (one-way trips), which is a volume that can adequately be handled by local bus service. In summary, Columbia Road does not provide a needed link for a possible light rail or busway system from Grove Hall or Dorchester to downtown, nor does it stand on its own as more than a local bus link.

Potential busway alignments on Seaver Street from Egleston to Blue Hill Avenue and on Talbot Street from Blue Hill Avenue to Ashmont were added as a result of comments made at the October 26 Project Working Committee Meeting. Such alignments would improve crosstown service in the southern sections of the study area.

Q. WHY WAS COMMUTER RAIL INCLUDED AS AN OPTION?

Commuter rail alone cannot provide replacement service for the Orange Line in the South End and Roxbury communities, and therefore, would have to be implemented in conjunction with other modes to create a viable transportation alternative for study area. In addition, its traditional operating characteristics are not necessarily well-suited to study area needs for the high frequency, low-fare transportation. However, this mode can be implemented quickly and inexpensively and, in conjunction with other modes, satisfy the area's travel needs. In the long run, commuter rail service possibly could be upgraded, through electrification and by providing service to downtown Boston and North Station, as part of the proposed Central Artery reconstruction project. Therefore, it is recommended as an option for further analysis in Phase II.

Q. WHAT WERE THE COMMENTS RECEIVED FROM RESIDENTS IN THE STUDY AREA?

Community goals vary throughout the study area. Representative comments received from residents of the various zones of service in relation to new transit alternatives are listed below on the basis of the community contacts established during the study.

South End

- o Strong preference for light rail over bus alternatives.
- o Provide Replacement Service prior to demolition of the Washington Street El or as soon as possible thereafter.
- o Want new service with speed and downtown distribution of existing Orange Line, with more stops in South End, and expedient free transfer to other MBTA lines.
- o Want a service which will stimulate development along Washington Street.

Roxbury

- o Prefer rapid transit or light rail over bus.
- o Prefer Warren Street alignment over Blue Hill Avenue or Midland Branch.

- o If rail service is put on Midlands north of Grove Hall, provide other parallel service.
- o Reinforce existing commercial modes at Dudley, Grove Hall and Uphams Corner and stimulate development elsewhere.
- o Provide Replacement Service to Dudley prior to demolition of the Washington Street Elevated or as soon as possible thereafter, and retain Dudley as major interchange point.

Dorchester/Mattapan

- o Bus or trolley on a median reservation on Blue Hill Avenue may lead to pedestrian safety problems due to high-speed automobile traffic.
- o Avoid major changes which would drastically change neighborhood character. New service may not be needed if short-term improvements are made.
- o Provide expedient transit from the southern areas to Dudley and vice-versa.
- o Encourage commercial revitalization of Blue Hill Avenue with fixed rail transit as a stimulus.

Q. WHAT HAPPENS AFTER THE PROJECT WORKING COMMITTEE MEETING IN JANUARY 31, 1978?

Minutes of the meeting and any written comments on the recommendations received at the Project Office prior to February 7, 1978 will be incorporated in the Phase I Feasibility Report to be submitted to UMTA.

It is anticipated that authorization to proceed with Phase II will be received from UMTA within 60 days after submission of the Phase I Report.

Prior to initiation of Phase II, meetings of the Coordinating Committee will be held to discuss: the scope of work for Phase II; formation of task forces on specific issues; and the community participation process during Phase II.

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estudio del reemplazamiento y mejora de transito

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Pocket Plat
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¿QUÉ HA OCURRIDO DURANTE LA FASE I DEL ESTUDIO ...?

¿QUÉ PASARÁ EN EL FUTURO?



SUMARIO DEL REPORTE DE LA FASE I

¿En qué consiste el Estudio de Reemplazamiento y Mejora de Tránsito?

Análisis de las necesidades del transporte público para desarrollar un nuevo plan.

Dicho estudio es un análisis cuidadoso de las necesidades presentes y futuras de transporte en las regiones del: South End, Roxbury, Dorchester y Mattapan. La meta consiste en decidir cuáles servicios específicos serán establecidos después de remover el elevado de la calle Washington y, sobre todo, el desarrollo de un sistema de tránsito apropiado para la zona.

¿Porqué se está haciendo el estudio?

El estudio preparará la información necesaria para mejorar el servicio de tránsito en la zona.

El estudio preparará la información necesaria para la implementación de cualquier método de tránsito, nuevo o mejorado, y sus servicios en el área bajo estudio. En 1972, después del estudio de la BTPR (Boston Transportation Planning Review), la construcción del Southwest Expressway fue cancelada. El gobernador, de acuerdo con los residentes de estos barrios, decidió que el elevado de la línea naranja en la calle Washington fuera relocalizado en el área anteriormente preparada y reservada para el Expressway.

En aquella época, fue reconocido que era necesario ofrecer una forma de servicio de reemplazamiento incorporando éste la posible extensión de servicios a Dorchester y Mattapan y que todo constituiría una parte muy importante del plan de transporte para el área Suroeste. En este mismo estudio se presentó una discusión de posibles mejoras a efectuar en el servicio de autobuses ya existente, mediante la cooperación entre los departamentos de la MBTA de Operaciones y de Asuntos de la Comunidad.

¿Qué factores fueron considerados para evaluar las distintas alternativas?

Metas de la Comunidad

- Satisfacer las metas de la comunidad.
- Aceptación en la comunidad.

"¿le gusta el sistema propuesto a la mayoría de la comunidad?"

Servicios de Transporte

- Reemplazo del elevado de la calle Washington.
- Rinde servicios a los mayores centros comerciales.
- Mejoras en el tiempo utilizado en uso de medios de transporte.
- Observación estricta de horarios.
- Comodidad.
- Seguridad.
- Cambios entre líneas.
- Servicio a los ancianos e inválidos.
- Rapidez en el establecimiento del sistema.
- Impacto sobre otros servicios de transporte.
- Potencial de aumento de construcción, mejoras futuras y expansión del sistema.

"¿cuál sistema será el más puntual en salidas y llegadas?"

"¿cuando podremos usar el nuevo sistema de tránsito?"

Tecnología y Compatibilidad del Sistema

- Tecnología segura y comprobada.
- Compatibilidad con el equipo de la MBTA.
- Compatibilidad con prácticas laborales de la MBTA.

Efectividad de Costo

- Costo capital.
- Costo por persona usando el sistema.
- Relación entre costo y ahorro de tiempo en viaje.

"¿acaso es el sistema tan caro que el gobierno federal no dará fondos para su construcción?"

Factores que Afectan al Medio Ambiente.

- Efecto a las tierras privadas/estructuras/parques/lugares de interés histórico.
- Efecto a los peatones/ciclistas.
- Interrupciones en las actividades del barrio/ o unidad.
- Interrupción de actividades de la construcción.
- Impactos del ruido.
- Contaminación atmosférica.
- Consumo de energía.

"¿va este sistema a separar el barrio en dos o a unirlo?"

"¿reducirá el establecimiento de este sistema el consumo de energía y la contaminación atmosférica?"

Uso de Tierras y Desarrollo de las Mismas

- Impacto sobre el uso de tierras presente y futuro.
- Promoción de los planes de desarrollo de terrenos.
- Impacto sobre el precio de terrenos.

"¿este nuevo sistema aumentará o rebajará el valor de mis propiedades?"

"¿me llevará este nuevo servicio más rápido a donde quiero ir?"

"¿les permitirá este nuevo sistema a los niños cruzar la calle con seguridad?"

"¿será fácil para los ancianos e inválidos el uso del nuevo sistema?"

"¿ha sido probado el sistema bajo condiciones similares?"

"¿cuál es el costo per capita del sistema para aquellos que lo usaran?"

"¿aumentará dicho sistema el nivel del ruido en mi barrio?"

"¿si el nuevo sistema de tránsito se coloca en esta ruta, acaso nos traerá o ayudará a traer más trabajo para todos?"

¿Cuál fue el proceso técnico utilizado para seleccionar las alternativas del tránsito?

Desarrollar alternativas de tránsito considerando las personas que las usen

Primero una variedad de modos (vehículos de tránsito en túneles, en una faja central, o en las calles) fueron examinados en tres rutas, creando una serie de "alternativas generales". El análisis de éstas en relación a factores descritos en la página anterior resultó en alternativas específicas. El número de personas que pudieran utilizar el sistema fue definido tentativamente al considerarse sus usos del sistema y los posibles ahorros de tiempo y costo por cada sistema.

Cinco análisis técnicos fueron hechos durante la Fase I

Análisis de tecnología

Una serie de posibles tecnologías de tránsito fue investigada eliminándose aquellas no amenas a la investigación detallada y se obtuvieron datos para comparar modos que pudieran resultar útiles.

Análisis de Derecho de Paso

Se investigaron las calles principales y otras para posibles rutas de tránsito.

Análisis de Servicios

Se examinaron los servicios presentes de autobuses y trenes para encontrar e identificar sus deficiencias y también sus potenciales para mejoras a corto o largo plazo.

Análisis de Desarrollo de Terrenos

Se examinó el impacto de modos de tránsito y rutas en el desarrollo de terrenos localizados dentro del área bajo estudio.

Análisis de Costo

Se consiguieron datos preliminares sobre capital de tránsito y costos de operación para su uso en investigar la relativa costo-efectividad de las alternativas de tránsito.

¿Porqué fueron recomendados autobuses, tranvías y trenes suburbanos?

La Tabla de Análisis de Tipos de Vehículos indicó que los autobuses y los tranvías son claramente más costo-efectivos que los trenes suburbanos o el subterráneo. La posible interrupción del tráfico en las calles, el movimiento de peatones y la necesidad de usar parte de los terrenos privados cuando se instalen autobuses o tranvías serán examinados en la Fase II.

Los trenes suburbanos en el ferrocarril Midland son recomendados para futuros estudios. El servicio de trenes se puede establecer rápidamente y sin costo excesivo y, en conjunto con otros modos, puede abastecer las necesidades del área en lo referente a transporte y viajes.

Debido a su costo-efectivo no aceptable, se recomienda que todas las alternativas que emplean el subterráneo sean eliminadas antes de la Fase II.

¿Cuáles alineamientos fueron seleccionados y porqué?

Zona 1

Desde el South End hasta Dudley Station.

Solamente uno de los alineamientos es posible en la calle Washington porque esta calle posee la anchura suficiente y una localización muy céntrica en el South End y Lower Roxbury. La calle Washington pudiera ser usada por autobuses o tranvías.

Zona 2

Desde Dudley Station hasta Grove Hall.

Alineamientos para autobuses con miras a servicio a los centros comerciales de la ciudad son posibles en la calle Warren o Blue Hill Avenue. Debido a que la adquisición de terrenos privados no sería muy conveniente en la calle Warren al sur de la calle Quincy donde el derecho de paso está limitado, y considerando que la construcción de túneles para autobuses no es práctica, la mejor idea es que la opción de usar autobuses debería ser considerada para Blue Hill Avenue. Una faja reservada para autobuses por la calle Seaver y Columbus Avenue hasta Jackson Square y posiblemente Brookline Village también será considerada.

Zona 3

Desde Grove Hall hasta Mattapan Square.

El ferrocarril de Midland se recomienda porque posee grandes ventajas en términos de costo, rapidez de implementación, operaciones de tránsito y su localización céntrica en esta zona. Blue Hill Avenue tiene bastante derecho de paso al sur de Grove Hall para una faja reservada de autobuses o tranvías y también se recomienda porque la realización de dicho proyecto ayudaría a levantar las condiciones de desarrollo comercial ya existentes. Una posible ruta en la calle Talbot desde Ashmont Station hasta Blue Hill Avenue también será recomendada para un análisis más profundo.

Zona 4

Desde Columbia Point a Northeastern.

El alineamiento de la calle Dudley fue examinado con miras a un servicio a través de la ciudad en la Fase I porque conecta directamente a Dudley Station y Uphams Corner. Sin embargo, el derecho de paso está restringido a través de toda esta ruta (aunque la adquisición de terrenos privados puede que sea posible a todo lo largo de esta ruta). Por lo tanto, el análisis de la Fase II debe incluir la consideración de otros probables alineamientos paralelos.

¿Qué ocurrirá próximamente en la Fase II?

Análisis técnico detallado	La Fase II comenzará después de un repaso y aprobación por la UMTA del reporte hecho para la Fase I. Durante la Fase II los consultores prepararán un análisis técnico detallado para un estudio de las influencias del proyecto sobre el medio ambiente (Environmental Impact Statement) el cual se someterá a consideración hacia el final del estudio.
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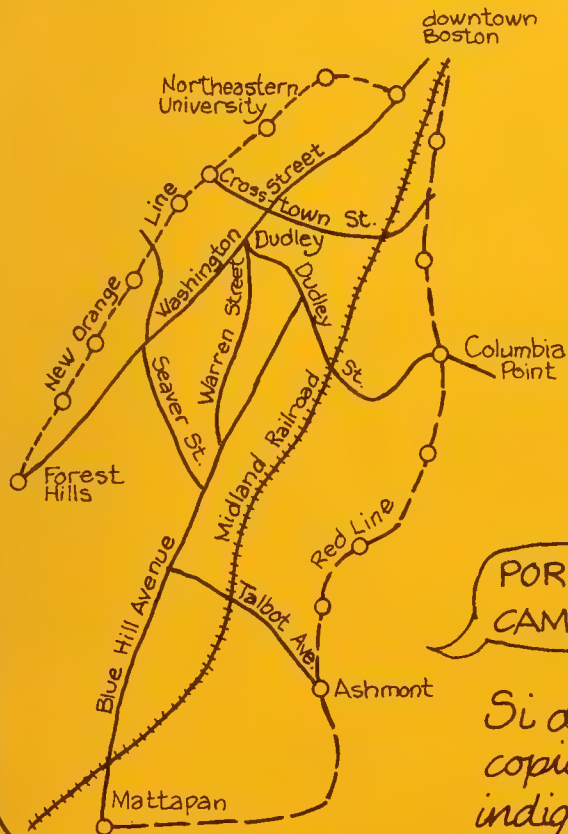
Reuniones comunitarias	El estudio seguirá ofreciendo reuniones del Comité de Trabajo del Proyecto y de la Comisión Coordinadora durante toda la Fase II. Habrá también reuniones locales en las zonas de servicio tal y como se necesiten para revisar los resultados de los análisis alternos. Se recomienda que los miembros de la comunidad asistan a todas dichas reuniones.
------------------------	---

mis sugerencias:

- ☐ Yo estoy de acuerdo con las recomendaciones del reporte de la Fase I.
- ☐ Yo no estoy de acuerdo con las recomendaciones del reporte de la Fase I

porque: _____

Deseo sugerir lo siguiente para la Fase II del estudio:



POR FAVOR USE ESTE MAPA PARA INDICAR CAMBIOS DE RUTAS Y SUGERENCIAS

Si desea recibir por correo copias del estudio, por favor indique su nombre y dirección

Indique sus ideas, doble la hoja, a ségürela y mándala por correo



replacement/transit
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¿Cuáles son las conclusiones acerca del mejoramiento del servicio actual?

El estudio ha evaluado los servicios de tránsito actuales para poder identificar las mejoras a corto plazo en el área. Las conclusiones principales fueron:

- El ajuste a horarios debe ser mejorado.
- Servicio directo desde Franklin Field y Mattapan hasta Dudley Station debe ser ofrecido al público aunque fuera solamente durante un determinado período de prueba.
- Las condiciones de aglomeramiento de pasajeros y velocidades demasiado bajas en algunas rutas de autobuses pueden ser mejoradas mediante el aumento de la frecuencia de salidas y mediante cambios en la ingeniería de tráfico.
- Servicio adicional a través de la ciudad a Back Bay y a Fenway debe ser estudiado.

La MBTA condujo una encuesta e investigación de las rutas que los residentes indicaron que ofrecen el servicio más pobre en el área bajo estudio. Información pertinente fue acumulada sobre la puntualidad de servicios en dichas rutas y en estos momentos se están aplicando medidas correctivas para resolver los problemas que fueron encontrados.

Un resultado importante de la investigación ha sido que muchos residentes del área en cuestión se han enterado de la información correcta que deben incluir al formular quejas sobre los servicios ofrecidos.

¿Cómo puedo obtener más información detallada?

El Reporte de la Fase I se puede conseguir en las bibliotecas locales o llamando al teléfono 427-7060.

¿Cómo puedo formular mis sugerencias?

Ya que Ud. ha leído el reporte se dará cuenta de que debe rellenar el cuestionario incluido en el mismo y enviarlo por correo. Por favor venga a las reuniones durante la Fase II o llame al teléfono 427-7060.

BAA

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¿Quién está Dirigiendo el Estudio?

Consultores de
la MBTA con
participación
de la
comunidad

El estudio está dirigido por la Oficina de Desarrollo del Corredor del Suroeste (Southwest Corridor Development Office) de la MBTA.
La CTPS (Central Transportation Planning Staff), una agencia del Estado de Massachusetts, está preparando las predicciones de pasajeros de tránsito.

Las firmas consultoras que han participado en el estudio son:

- Tippetts-Abbett-McCarthy-Stratton (TAMS)
 - supervisión general del proyecto
 - ingeniería de transporte
- CBT/Childs Bertman Tseckares & Casendino, Inc.
 - participación comunitaria
 - presentación y diseño urbano
- Greater Roxbury Development Corporation
 - análisis de los bienes raíces en la comunidad
- John Brown Associates
 - planeamiento urbano
- Cambridge Systematics, Inc.
 - metodología de las predicciones

El estudio de Reemplazamiento y Mejoras de Tránsito está subvencionado por la UMTA (Urban Development Transit Administration) del Departamento de Transporte de los EE.UU.

Si desea una información más amplia sobre el estudio, llame al teléfono 427-7060.

replacement/transit improvement study

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What happened in **Phase I** of the study ?

... and what's happening next ?

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2 of 4

a summary of the

Phase I Feasibility Report

Si Usted no puede leer esto en Ingles, también lo tenemos en ESPAÑOL. Por favor llame 427-7060.

This summary report is available in Spanish.

What is the Replacement/ Transit Improvement Study?

Analysis of transportation needs to develop a new plan

The study is an analysis of current and future public transportation needs in the South End, Roxbury, Dorchester and Mattapan areas of Boston. The objective is to decide on specific services upon removal of the Washington St. Elevated and to develop an overall transportation strategy for the area.

Why is this study being done?

To prepare information for improved area transit services

This study will prepare the necessary information for the implementation of any new or improved transit services in the study area. In 1972, after the Boston Transportation Planning Review (BTPR), construction of the proposed Southwest Expressway was cancelled. The Governor concluded, in concert with residents of these neighborhoods, that the Washington Street Elevated Orange Line should be relocated into the corridor cleared for the expressway.

At that time, it was recognized that some form of replacement service, with the possible extension of that service to Dorchester and Mattapan was an important part of a transportation plan for the Southwest area. A related opportunity presented by this study is a discussion of improvements to the existing bus service by working with the MBTA Operations and Community Affairs Departments.

What is the schedule?

1977



← ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ **Phase I** ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ →

What factors were used to evaluate various alternatives?

Community Goals

- Meets Community Goals
- Community Acceptance

Transportation Service

- Replaces Washington St. Elevated
- Serves Major Commercial Centers
- Travel Time Improvements
- Schedule Adherence
- Comfort
- Safety
- Security
- Transfers
- Service to Elderly and Handicapped
- Speed of Implementation
- Impact on Other Transportation Services
- Potential for Incremental Construction, Future Upgrading, and Expansion

Technology and System Compatibility

- Proven Technology
- Compatibility with MBTA Equipment
- Compatibility with MBTA Labor Practices

Cost Effectiveness

- Capital Cost
- Cost per Transit Rider
- Ratio of Cost to Travel Time Savings

Environmental Factors

- Required Takings of Land/Structures/Parks/Historical Sites
- Impact on Pedestrians/Bicycles
- Neighborhood Disruption/Cohesion
- Construction Disruption
- Noise Impacts
- Air Pollution
- Energy Consumption

Land Use/Land Development

- Impact on Existing and Proposed Land Uses
- Enhancement of Land Development Goals
- Impact on Land Values

"is the new service going to get me to where I want to go faster?"

"will the proposed system allow children to safely cross the street?"

"is the new system easy for elderly or handicapped people to use?"

"has this system been tested in similar conditions?"

"how much does the system cost for each new transit rider?"

"will the system increase noise in my neighborhood?"

"how much will this system reduce energy consumption and air pollution?"

"will the value of my property increase or decrease as a result of this new transit?"

"do most of the people in the community like the proposed system?"

"which system is most likely to arrive and leave on schedule?"

"how soon will we be able to ride the new system?"

"is the system so expensive that the federal government will not fund it?"

"will this alternative split the neighborhood in half or link it together?"

"if new transit is put on this route will it help bring in new businesses and stores with jobs for us?"

1978

1979

1980

WE DISCUSSED RECOMMENDATIONS FOR A COMBINATION OF VEHICLE TYPES AND ROUTES WITH THE COMMUNITY AT AN OCTOBER 26 MEETING

THE FEASIBILITY REPORT WAS PUBLISHED DESCRIBING PHASE I CONCLUSIONS AND WHAT WILL BE STUDIED IN PHASE II

AFTER FEDERAL (UMTA) AND STATE (MBTA) REVIEW OF THE PHASE I REPORT, THE DETAILED EVALUATION OF SPECIFIC ROUTES AND TYPES OF VEHICLES SELECTED IN PHASE I BEGINS

PHASE II WILL INCLUDE COMMUNITY MEETINGS THAT EXAMINE THE DETAILED ANALYSIS OF ALTERNATIVES IN THREE INTERDEPENDENT AREAS - SOUTH END TO DUDLEY, DUDLEY TO GROVE HALL AND GROVE HALL TO MATTAPAN

A DRAFT ENVIRONMENTAL IMPACT STATEMENT (E.I.S.) AND A RECOMMENDED ALTERNATIVE REPORT WILL BE SUBMITTED TO THE FEDERAL GOVERNMENT

IN PHASES III AND IV WE WILL INCORPORATE THE COMMENTS FROM THE FEDERAL GOVERNMENT, RESIDENTS AND NEIGHBORHOOD AGENCIES INTO THE DRAFT E.I.S. REPORT, A PUBLIC HEARING WILL BE HELD AND IMPLEMENTATION FUNDING APPLICATIONS WILL BE PREPARED

THE FINAL ENVIRONMENTAL IMPACT STATEMENT WILL BE PREPARED REFLECTING COMMENTS FROM THE HEARINGS

REVIEW PERIOD

REVIEW PERIOD

IMPLEMENTATION BEGINS

Phase II Phases III/IV

What vehicle types were studied?

What was the technical process used to select transit alternatives?



RAPID TRANSIT/
SUBWAY CAR
(In Tunnel or on
Railroad Line)

BUS
(In Median
or on Street)



COMMUTER RAIL
(On Railroad
Line)

TRACKLESS
TROLLEY
(In Median or
on Street)



STREETCAR/LIGHT
RAIL VEHICLE (LRV)
(In Tunnel
in Median
or on Street)

possible people carriers

Develop
transit
alternatives
with potential
riders

First a variety of modes, (transit vehicles in tunnels, medians or on streets) were examined on three routes creating a series of "generalized alternatives." Analysis of these against the factors described on the previous page resulted in specific alternatives. The potential riders that might be attracted were then estimated for these alternatives as well as potential travel time savings and cost for each system.

Five technical analyses were done in Phase I:

Technology
Analysis

investigated a wide range of potential transit technologies, eliminating those not suitable for detailed investigation and providing data to compare modes that were suitable

Right-of-way
Analysis

investigated major streets and other alignments for potential transit routes

Service
Analysis

looked at current rail and bus transit service to identify deficiencies and potential short and long range improvements

Land
Development
Analysis

examined the relative impact of transit modes and alignments on the development of land in the study area

Cost
Analysis

provided preliminary data on transit capital and operating costs for use in investigating the relative cost-effectiveness of the transit alternatives

What routes and vehicle types were recommended to be studied in Ph

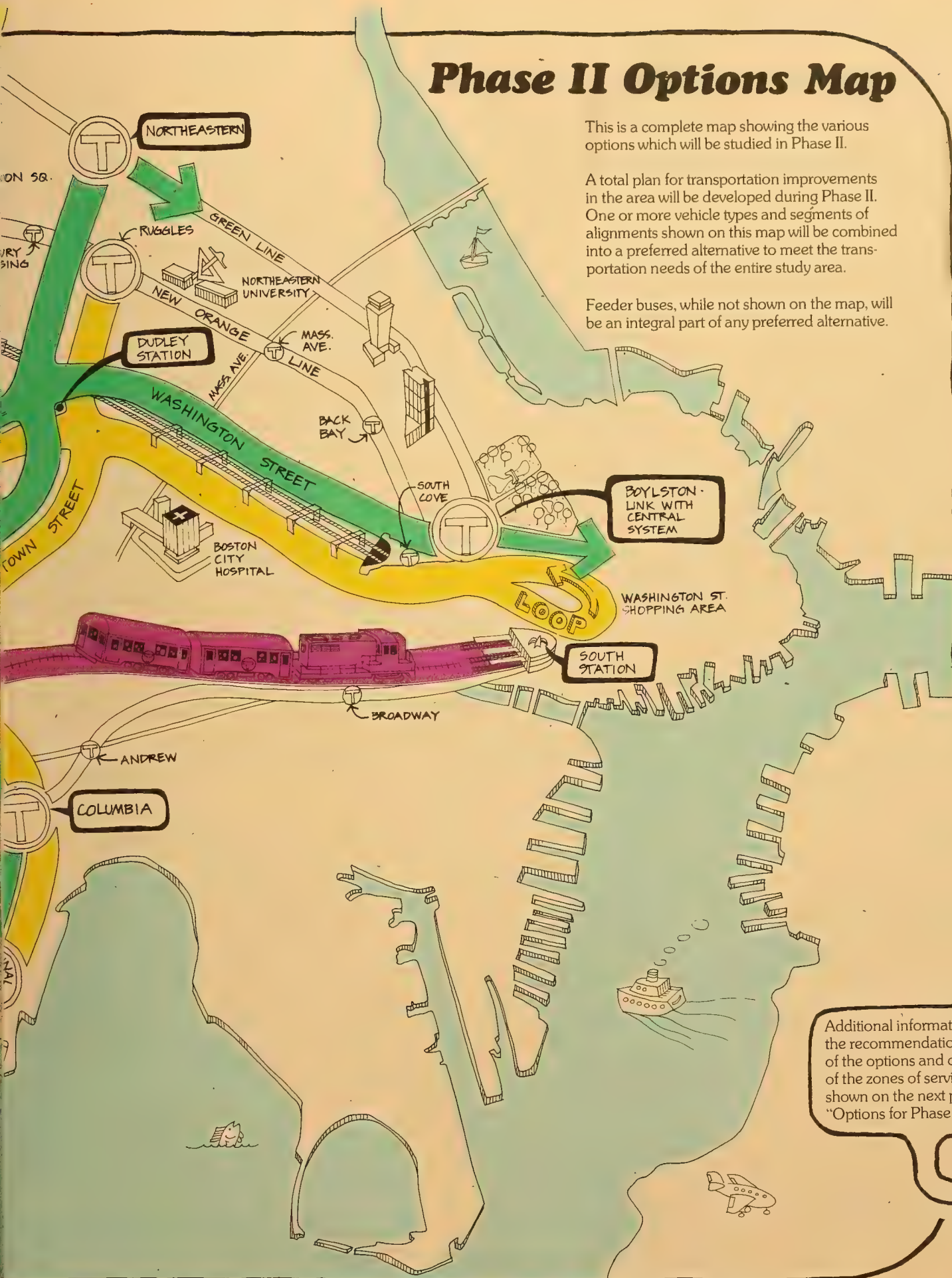


Phase II Options Map

This is a complete map showing the various options which will be studied in Phase II.

A total plan for transportation improvements in the area will be developed during Phase II. One or more vehicle types and segments of alignments shown on this map will be combined into a preferred alternative to meet the transportation needs of the entire study area.

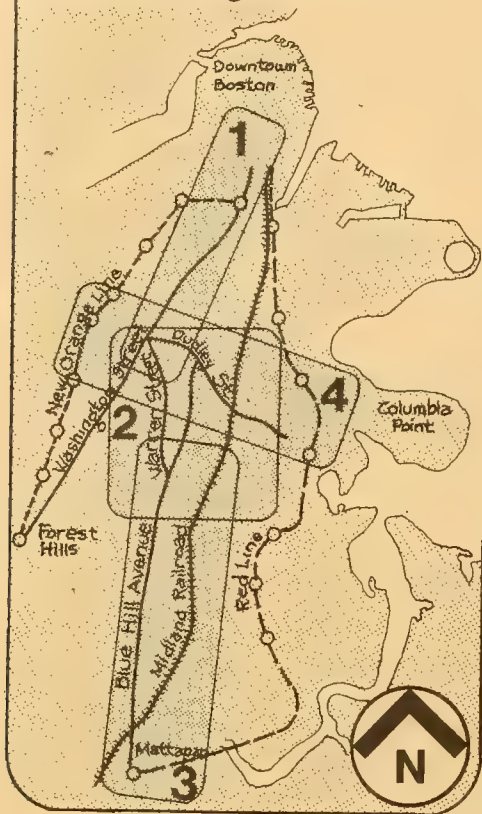
Feeder buses, while not shown on the map, will be an integral part of any preferred alternative.



Additional information about the recommendations, details of the options and descriptions of the zones of service are shown on the next page. See "Options for Phase II" chart.

Which vehicle types and alignments are recommended for Phase II study?

Zones of Service



Zone of Service	Impacted Area	Alignment (Routes)	Mode (Vehicle Type)				Remarks
			BUS	LIGHT RAIL VEHICLE	RAILROAD	RAPID TRANSIT	
			Exclusive Right of way	Exclusive Right of way	Exclusive Right of way	Exclusive Right of way	
			Destination				
			Downtown Shopping District	enters Green Line at Boylston or Huntington	South Station	Orange Line at Ruggles or So. Cove	
1	South End to Dudley Station	Washington Street	*	*			• loses transit service as Orange Line is relocated • Washington St. most feasible—wide and centrally located in zone
2	Dudley Sq. Grove Hall Mt. Bowdoin Uphams Corner	Blue Hill Avenue	*	*			• limited right of way • centrally located in zone • opportunities for development
		Warren Street	*	*			
		Midland Railroad		*	*		• exclusive grade-separated • lower cost
		Seaver-Columbus	*				• provides crosstown service
3	Franklin Field Mattapan	Blue Hill Avenue	*	*			• stimulates business area
		Midland Railroad		*	*		• exclusive grade-separated • lower cost • centrally located in zone
		Talbot Avenue	*				• provides crosstown service
4	Northeastern University Dudley Sq. Uphams Corner Columbia Pt.	Crosstown St. Wash. St. Dudley St. Columbia Pt.	*	*			• right of way is limited • generates greatest number of new transit riders

★

Recommended Transit Segments





▣

Segments Not Recommended

Options for Phase II Study

★ Recommended Transit Segments
 □ Segments Not Recommended

Options for Phase II Study

Vehicle Type	Transportation Service -- User Benefits	Environmental Impact	Land Use/ Land Development Impact	Cost-Effectiveness Factors			
				Capital Cost	Cost/ Rider	Cost/ New Rider	Cost/ Travel Time Savings Ratio
 RAPID TRANSIT/ SUBWAY CAR (In Tunnel or on Railroad Line)	Fastest service to downtown Minimal disruption to surface traffic Best potential schedule adherence Longest probable implementation Causes split service on Orange Line Wide station spacing	Limited required land takings except at stations Greatest potential construction disruption	Could provide major incentive to development in vicinity of stations	\$315-637 million	\$1.70-3.00	\$13.50-18.60	6.7-11.2
 RAILROAD (On Railroad Line)	Does not replace Orange Line service Needs other improvements Good potential schedule adherence Capacity problems at South Station High comfort rating Poor transfer capability Potential quick implementation Least impact on surface traffic Wide station spacing	Least required land takings Minimal construction disruption	Minimal stimulus to development	\$16-32 million	\$0.90-1.30	\$11.70-18.60	4.4-7.0
 STREETCAR/LIGHT RAIL VEHICLE (LRV) (In Tunnel in Median or on Street)	Best downtown and Back Bay connections Good potential for incremental construction Potential disruption to surface traffic Frequent station locations	High potential land takings on narrow existing streets High potential for construction disruption	Could provide incentive for development along major streets	\$82-202 million	\$0.60-1.30	\$4.00-9.20	2.9-6.9
 BUS (In Median or on Street)	Best transit coverage Best potential to minimize transfers Worst potential schedule adherence Potential quick implementation Potential disruption to surface traffic Good potential for incremental construction	Greatest source of air pollution and noise of transit modes on the street	Lesser investment in fixed facilities provides less incentive for development	\$5.7-14.3 million	\$0.50	\$2.40-2.90	2.4-2.7

Analysis of Vehicle Types

Why were Bus, Light Rail and Commuter Rail vehicles recommended?

Best combination of user benefits, area-impact and cost-effectiveness characteristics.

The Analysis of Vehicle Types table indicates that Bus and Light Rail modes meet the transportation needs of the area and are clearly more cost-effective than Commuter Rail and Rapid Transit. Potential disruption to surface traffic and pedestrian movement and the need for property takings caused by Bus and Light Rail modes will be examined in Phase II.

Commuter Rail on the Midland Railroad is recommended for further study. Railroad service can be implemented quickly and inexpensively and, in conjunction with other modes, can help satisfy the area's travel needs.

Because of their poor cost-effectiveness, it is recommended that all Rapid Transit alternatives be eliminated prior to Phase II.

Why were these alignments recommended?

ZONE 1

South End to Dudley Station

Only one alignment is feasible, Washington Street, because of its width and central location in the South End and lower Roxbury. Washington Street can be used by either buses or light rail vehicles.

ZONE 2

Dudley Station to Grove Hall

Busway alignments for downtown-oriented services are possible on either Warren Street or Blue Hill Avenue. Because land taking would be undesirable on Warren Street south of Quincy Street where right-of-way is limited, and since bus tunnels are not practical, it is likely that all busway options would run on Blue Hill Avenue in this area. A busway running along Seaver Street and Columbus Avenue to Jackson Square and possibly Brookline Village will also be examined.

Light rail alternatives are recommended for further study along Warren Street, Blue Hill Avenue and the Midland Railroad, but not on the Washington-Seaver and Columbia Road segments (also examined during Phase I) since these require expensive land takings. The Washington-Seaver alignment also has slightly lower ridership and less savings in overall travel time than other routes in Zone 2 because of its proximity to the relocated Orange Line.

Columbia Road was not recommended because it does not provide a needed link for a possible light rail or busway system from Grove Hall or Dorchester to downtown, nor does it stand on its own as more than a local bus link.

ZONE 3

Grove Hall to Mattapan Square

The Midland Railroad is recommended because of its advantages in terms of cost, travel speed, and transit operations, and its central location in the zone. Blue Hill Avenue has sufficient right-of-way south of Grove Hall for either busway or light rail options and is also recommended since it would help upgrade already existing commercial development. A possible busway segment on Talbot Avenue from Ashmont Station to Blue Hill Avenue is also recommended for further analysis.

ZONE 4

Columbia Point to Northeastern

The Dudley Street alignment was analyzed for crosstown service in Phase I because it directly connects Dudley Station and Uphams Corner. However, its right-of-way is constricted throughout (although property takings may be possible along most of its length). Consequently, Phase II analysis should also examine other potential parallel alignments.

What were the conclusions about improving service?

Short term changes could improve service.

The study evaluated current transit service to identify short term improvements for the area. The major conclusions were:

- Schedule adherence needs to be improved
- Direct service from Franklin Field and Mattapan to Dudley should be provided on at least a trial basis.
- Overcrowding and low overall bus speeds on some routes can be improved by increasing frequency and making traffic engineering changes.
- Additional crosstown service to Back Bay and Fenway should be studied.

The MBTA conducted a survey of routes most often cited for poor service in the study area. Data was collected on schedule reliability and steps are now being taken to correct the problems that were discovered.

An important by-product of this survey is that many area residents are now aware of what information to include in service-related complaints.

.....and what could the recommended system look like?



Bus in median reservation (Wide Street)



Railroad in existing right-of-way



Light Rail Vehicle (LRV) in median reservation (Wide Street)



Light Rail Vehicle (LRV) in tunnel (Narrow Street)



Light Rail Vehicle (LRV) in existing railroad right-of-way

Possible Transit Systems

How can I get more detailed information?

The Phase I Feasibility Report is available at local libraries and Little City Halls or by calling 427-7060.

How can my suggestions be made?

Now that you have read the summary report, you can fill out the enclosed suggestion sheet and mail it. Come to meetings during Phase II or phone 427-7060.



What happens in Phase II?

Detailed Technical Analysis

Phase II will start after review and approval of the Phase I report by UMTA. During Phase II the consultants will work on detailed alternatives analysis in preparation for an environmental impact statement to be submitted at the end of the study.

Community Meetings

The study will continue to have Project Working Committee and Coordinating Committee meetings during Phase II. In addition there will be local meetings in the zones of service as required to review results of the alternatives analysis. The Community is encouraged to attend all of these meetings.

Who is doing the study?

MBTA and consultants, with agency and community participation

The study is being managed by the MBTA's Southwest Corridor Development office. Transit ridership forecasts are being prepared by the Central Transportation Planning Staff (CTPS), an agency of the Commonwealth of Massachusetts.

The consultant firms for the study are:

- Tippetts-Abbett-McCarthy-Stratton (TAMS)
 - Overall Management
 - Transportation Planning and Engineering
- CBT/Childs Bertman Tseckares & Casendino, Inc.
 - Community Participation
 - Presentation and Urban Design
- Greater Roxbury Development Corporation
 - Local Real Estate Analysis
- John Brown Associates
 - Urban Planning
- Richard Siegel Associates
 - Economics
- Cambridge Systematics, Inc.
 - Forecasting Methodology

ELEVATED
TERMINAL
STATION,
DUDLEY
STREET.
c. 1908



The Replacement/Transit Improvement Study is funded by the U.S. Department of Transportation Urban Mass Transportation Administration (UMTA)

Call 427-7060 for more information on the study.

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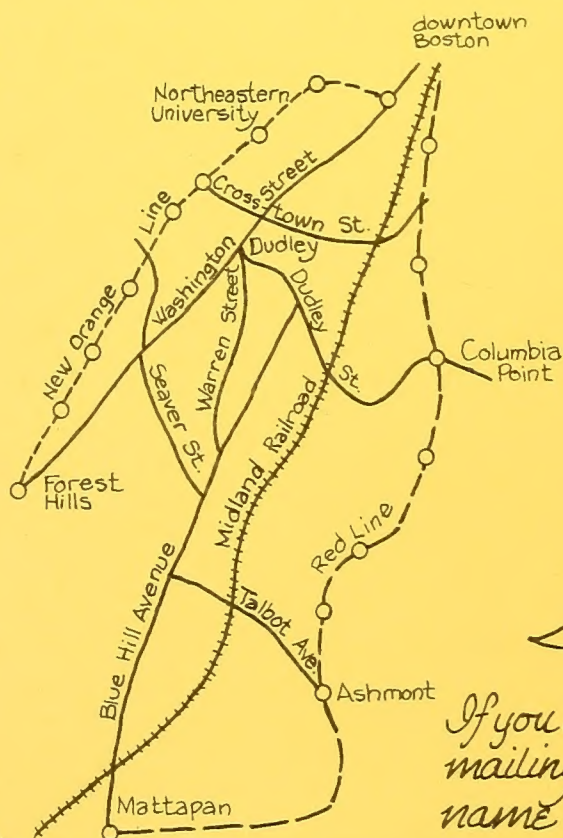
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my suggestions:

- ☐ I agree with the recommendations of the Phase I report
- ☐ I disagree with the recommendations of the Phase I report

because: _____

I would like to make the following SUGGESTIONS for Phase II
of the Study _____



PLEASE USE THIS MAP TO MAKE
ROUTE CHANGES AND SUGGESTIONS

If you desire to be on the study
mailing list, please put your
name and address here _____

Please make a note of your ideas above... then fold tape and mail



Summary Report

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